JULY 24, 1961
Volume 50, No. 15

July 24, 1961

•

OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

AMERICAN DYESTUFF REPORTER

Tighter profits make smarter buying!

Are pennies filtered from your returning dollar before the goods even leave your plant? As production zooms and profits lag, smart buying frees the squeeze on shrinking earnings. Through precision balance of quality and price, Wica has the confidence of customers who enjoy the growth of a broader earnings base.

Wica

SPECTRUM ACCURACY

WICA CHEMICALS, INCORPORATED
OLD CONCORD ROAD • CHARLOTTE, NORTH CAROLINA

HOWES PUBLICATION

X-TAN SPECIAL

SO EFFECTIVE YOU CAN ESTABLISH A STANDING BATH PROCEDURE!

- **INHIBITS CORROSION** of stainless steel by sodium chlorite solutions, even at a pH as low as 2.0.
- **STABLE, ECONOMICAL** X-Tan Special slows formation of chlorine dioxide to the rate it is used up in bleaching. By eliminating chlorine dioxide waste, sodium chlorite effectiveness is increased by as much as 50%.
- **EVEN WETTING AND BLEACHING** X-Tan Special reduces surface tension of the bleaching bath, resulting in a more uniform bleaching action.
- **BUFFERING, SIMPLE CONTROL** X-Tan Special stabilizes any pH on the acid side.

TANATEX

TANATEX CHEMICAL
CORPORATION

Belleville Turnpike, Kearny, New Jersey
Tanatex Chemical (Holland) N.V.
Laren (N.H.) The Netherlands

CHEMICALS FOR DIFFICULT PROCESSING

Prize fabrics that stop the eye . . . start the sale with Koppers dyes!

Brighten your sales picture with Koppers Dyes that set the mood for selling—developed to compliment every fiber with lasting, fresh color appeal. Today, color-conscious moderns have an educated eye for clean, rich shades with excellent fastness properties. AMACID* and CHROMAVEN* DYES bring out the full beauty of your woolens . . . AMACEL*, LENRA* and AMACRONS*, your synthetics—to help sell the fabrics on sight. These dyes, with excellent dispersibility and fastness properties, assure uniform results that meet every requirement. And don't forget, our *technical service* and complete laboratory facilities are always available. Call or write today.

*REG. U.S. PAT. OFF.

KOPPERS COMPANY, INC. *CHEMICALS AND DYESTUFFS DIVISION*

Pittsburgh 19, Pennsylvania

(FORMERLY AMERICAN ANILINE PRODUCTS) PLANT: Lock Haven, Pa.

BRANCHES: Providence, R. I. • Philadelphia, Pa. • Paterson, N. J. • Chicago, Ill. • Charlotte, N. C. • Chattanooga, Tenn. Columbus, Ga. • Los Angeles, Calif.

IN CANADA: Dominion Anilines & Chemicals, Ltd., Toronto, Canada • Montreal, Canada

VMA 6703

Now you can laminate foams without flames . . . cut costs too

Any producer now using open-flame methods of laminating foam to fabric can cut costs with new Hycar 2671 reactive acrylic latex. This new latex makes possible adhesives without the problems of stiffness or discoloration that adhesives used to have. It eliminates the difficulties of the open-flame procedure—reduces handling problems and speeds up production.

The resulting bond is outstanding. Washability and resistance to solvents is excellent. Hycar 2671 is easy to use—much simpler than other binders. It is self-curing and stable. One of the largest licensers of foam materials has approved its use as an alternate to flame methods.

Hycar 2671 is also producing unusually effective back coatings for knit goods, upholstery and drapery fabrics. It's another sample of service you can get to produce better textiles for wider appeal. For more information, write Department PG-8, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

PRODUCTS FOR TEXTILE IMPROVEMENT

B.F.Goodrich Chemical

a division of The B.F.Goodrich Company

American Dyestuff Reporter Vol. 50, No. 15 July 24, 1961. Published every other Monday. Printed at Easton, Pennsylvania. Copyright 1961 by Howes Publishing Co., Inc., 4 E. 23rd St., New York 10, N.Y. Domestic subscription $7.50; Canadian $8.50; Foreign $18.00. Second Class Postage paid at Easton, Pa.

when dyestuffs dull and caustic is the culprit...

switch to fmc® CAUSTIC

When it's made ... and when it's delivered ... FMC Caustic is low in iron and other contaminants. That minimizes danger of metallic deposits that can dull and discolor your goods during wet processing.

To protect its purity FMC Caustic is produced in automatically controlled cells, transmitted through nickel pipes and stored in lined tanks. Then, as an extra precaution, it is "polish filtered" just prior to shipment!

FMC Caustic Soda is delivered fast from our South Charleston, West Virginia plant, strategically located to serve caustic users throughout the industrial East, South and middle West. In addition, our complete technical service facilities are always at your service.

On your next spot order, let FMC show how well we can serve you.

CAUSTIC SODA

Liquid 73%, Liquid 50%,
Regular and Low Chloride Grades;
Flake, Solid and Ground.

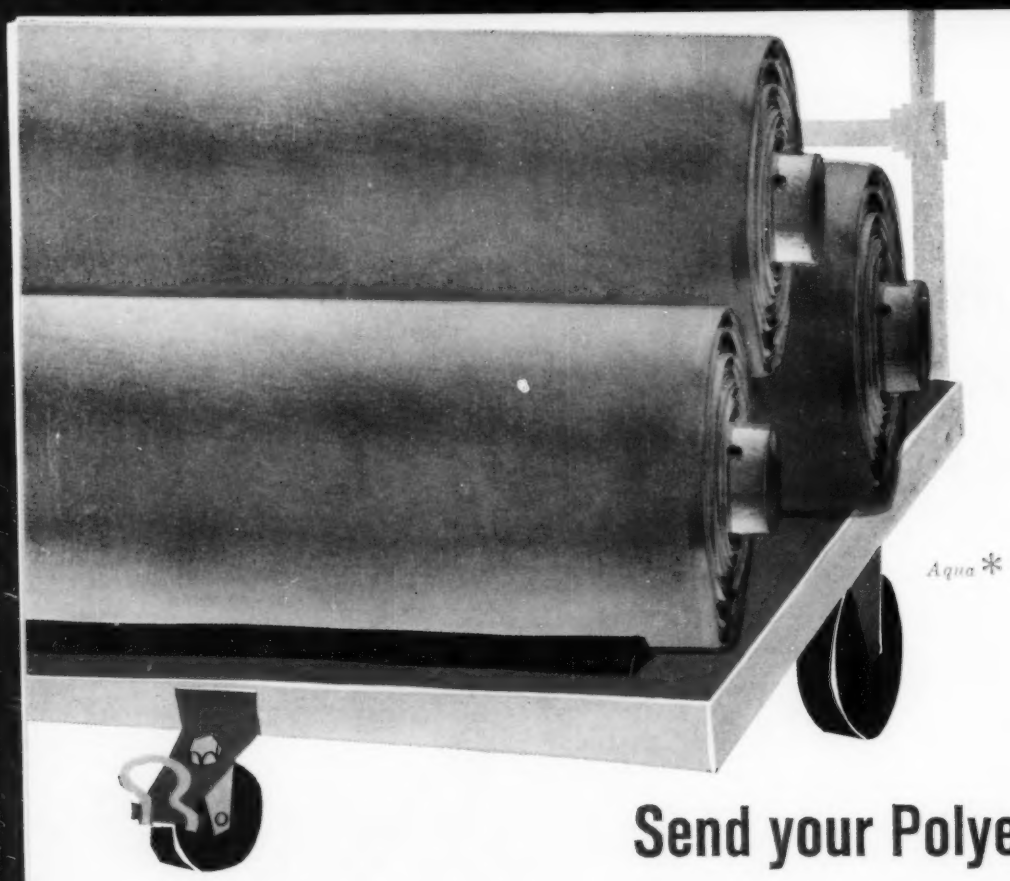
CAUSTIC POTASH

Liquid 45% and 50%;
Flake and Solid.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Chlor-Alkali Division

General Sales Offices:
161 E. 42nd STREET, NEW YORK 17



Send your Polyester Fabrics to market protected by the Outstanding Fastness of Eastman Polyester Dyes

Your Eastman representative will be glad to tell you about the performance advantages and economy of these dyes

Light shades, dark shades—as the demand for fabrics containing polyester fibers continues to grow, dyers are being called upon to deliver more shades, brighter shades, faster shades.

In step with this trend, Eastman offers an expanding series of polyester dyes, providing the best all 'round fastness characteristics of polyester dyes currently available.

Specifically developed for use with polyester fibers, these dyes exhibit outstanding fastness to washing, light, sublimation, crocking, perspiration, dry cleaning and wet pressing.

Equally important are their excellent processing characteristics...good build-up, good exhaustion and outstanding leveling properties.

Dyeing with Eastman Polyester Dyes is easily accomplished with carriers or under pressure at elevated temperatures. Fibers can be readily dyed as tow, tops, stock, or fabric. Fabrics of polyester filament can be conveniently dyed in jigs. Fabrics woven of spun polyester yarns alone or blended with cotton, viscose or wool can be easily dyed in dye-becks.

Get the full story of this outstanding line of dyes for polyester fabrics from your Eastman representative. Formulations and technical assistance on dyeing procedures are readily available.

Eastman Polyester Dyes

Eastman Polyester Dyes are sold in the United States by **EASTMAN CHEMICAL PRODUCTS, INC.**, subsidiary of EASTMAN KODAK COMPANY, in Kingsport, Tennessee; Lodi, New Jersey; and Greensboro, North Carolina. On the **West Coast** through WILSON & GEO. MEYER & COMPANY, San Francisco, Los Angeles, Portland, Seattle, Salt Lake City. In **Canada** through CLOUGH DYESTUFF CO., LTD., St. Laurent, P. Q.

* Try this formula on your next lot of aqua.

0.15% Eastman Polyester Yellow W
0.2% Eastman Polyester Blue GLF
3 g./l. of a suitable carrier
Material: Polyester
Bath Ratio: 30:1
Dyed 1 hour at boil

Polyester Yellow 5GLS
Polyester Yellow RL
Polyester Yellow W
Polyester Yellow 5R
Polyester Red B
Polyester Red 2G
Polyester Dark Red FL
Polyester Pink RL
Polyester Pink LB
Polyester Brilliant Orange 2RL
Polyester Blue GLF
Polyester Blue GR
Polyester Brilliant Blue 2RL
Polyester Blue 3RL
Polyester Blue BLF
Polyester Blue GB
Polyester Navy G
Polyester Violet R
Polyester Brown 3RL
Polyester Black RB
Polyester Diazo Black B

ESTABLISHED
1917

Including since 1921, the official Proceedings of the American Association of Textile Chemists and Colorists

AMERICAN DYESTUFF REPORTER

TEXTILE WET PROCESSING EXCLUSIVELY

VOLUME 50 July 24, 1961 NUMBER 15

NORMAN A JOHNSON
Editor

CHARLES A WHITEHEAD
Managing Editor

MYRON D REESER
Business Manager

HERBERT A STAUDERMAN
Advertising Manager

WILLIAM J O'CONNOR
Production Manager

BERYL A LAKNER
Circulation Manager

OFFICIAL
PUBLICATION
OF THE
PROCEEDINGS
AMERICAN
ASSOCIATION
OF
TEXTILE
CHEMISTS
AND
COLORISTS

American Dyestuff Reporter was founded in 1917 and the Textile Colorist was incorporated with it in January, 1949. Published every other Monday, by the HOWES PUBLISHING COMPANY, INC, 44 East 23rd Street, New York 10, NY. C R Howes, president; Ernest J Finan, executive vice president; Norman A Johnson, vice president & treasurer; Myron D Reeser, vice president; Clara Patrick, secretary.

Telephone SPring 7-9364

specially contributed

Kinds of "Neps" in Dyed Cotton Piece Goods 21 (544)
Charles F Goldthwait, Rachel L Wiles, and Virginia Ruiz von Sales

Dihydroxyethyleneureas as Wrinkle-resistance Finishing Agents for Cotton 27 (550)
Sidney L Vail, Paul J Murphy Jr, J G Frick Jr, and J David Reid

How to Get the Most Out of Your Water-softening System 31 (554)
R E Hinich

aatcc proceedings

American Standard Performance Requirements for Textile Fabrics 36 (P557)
Ephraim Freedman

Bow and Skew 46 (P567)
Lucille Rea and John D Robertson Jr

AATCC Calendar 49 (P570)

Membership Applications 49 (P570)

Elected to Membership 49 (P570)

Activities of the Local Sections 50 (P571)

Employment Register 52 (P573)

departments

Open Forum:—
Are Our Educational Processes Too Slow for the Space Age? 9 (543)

Future Papers 30 (553)

General Calendar of Coming Events 30 (553)

Abstracts 54 (574)

ADR News Report 57 (575)

Personalities in the News 60 (578)

Technical Literature 62 (579)

Copyright, 1961, Howes Publishing Co, Inc

Contents of previous issues can be found by consulting the Service and Technology Index and the Engineering Index, at your library

Marmix®

RESIN & RUBBER LATICES

Here, to meet your needs for resin and rubber latices, is Marbon Chemical's new multi-million dollar research and production facility on the Ohio River. In every way—plant facilities, equipment and personnel—you'll find Marbon the truly modern source for your requirements. Let us prove it—write today, Dept. B-3.

MARBON CHEMICAL DIVISION **BORG-WARNER**
WASHINGTON WEST VIRGINIA

ARE OUR EDUCATIONAL PROCESSES TOO SLOW FOR THE SPACE AGE?

THE chemist who feels "swamped" in his inability to keep up with the almost overwhelming flood of new information in the field may take some comfort in the words of Melvin S Newman, professor of chemistry, Ohio State University, who was honored last month by the Synthetic Organic Chemical Manufacturers Association.

Following receipt of the SOCMA Medal for Creative Research in Synthetic Organic chemistry, Dr Newman stated that he "finds it increasingly difficult to keep up with the new look that is being put out" even in his own field. Commenting that it is difficult to have a broad education in anything these days, especially in the sciences, Dr Newman stated: "I thought I knew a fair amount of chemistry in 1932. However, from 1932 to the present, I would say at least three times as much information, both practical and theoretical, has been accumulated, but we as individuals have not changed much. On ability to absorb new facts and theories we have not kept pace, so each of us has been falling behind no matter how we work."

In offering some suggestions as to what can be done about it, Dr Newman indicated that a "speeding up" of our education process is in order. Among other points he made was one which has been discussed by many educators, namely, an earlier start in foreign languages.

Certainly many of us are aware that there is greater emphasis on foreign languages in other countries. Whereas a good knowledge of English is commonplace among educated Japanese, for example, many of our students who struggled through one or two years of a foreign language in our secondary schools are hard pressed to remember anything about it two or three years later.

One must agree with Dr Newman that, as far as science goes, German and Russian will be the languages of the future, and yet where do people now get them? Most students cannot read an article in German.

Dr Newman's suggestion? Start them in kindergarten! At this young age, a child's ear for foreign languages could be tuned at the time he is playing and enjoying himself, but at a time in his life when his memory is sharp.

Another of Dr Newman's suggestions struck a responsive cord in this writer's ear—we must provide programs that really appeal to superior students! While it is a good thing to get education to as many as possible, we must do more for our superior students.

Never in the history of our country have we been engaged in a more crucial race with the forces of totalitarianism which seek to "bury" us— and yet we suffer in many quarters from the pap of "life adjustment" curricula, spread out over a longer period of formal education.

Consider, for example, that the average high school offers a course in chemistry in its fourth year. Consider also that the superior and/or industrious student, with no opportunity for acceleration, faces 12 years of elementary and secondary education before he is exposed to his first formal course in chemistry at the age of 18.

Admitting the fact that life expectancy has greatly increased over the past 100 years, one must still be impressed by the fact that William Henry Perkin entered the Royal College of Chemistry at the age of 15 and was doing some of his most important research at 17.

Can we afford the luxury, and are we being quite fair in setting an educational pace which may be far too slow for the industrious student?

The present four-year programs in high school and college give a child eight summers off. Dr Newman suggests that this is too much time off.

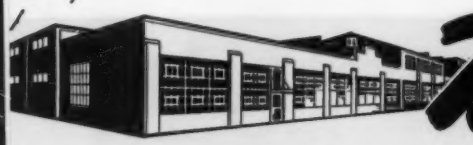
For the high school student, he suggests work in a laboratory in the summer, and his message to SOCMA members was to give such students as are interested the chance to clean up after experiments, wash the dishes, and learn how to do other chores around the lab.

For the college chemistry major, he suggests that extra-curricular work in the lab would yield tremendous dividends in helping him to get into the creative area at an early age.

We feel that such suggestions are equally applicable in other areas of scientific and business endeavor, but such acceleration must have the support of industry and educational leaders, who must provide the facilities for it if they are desirous of obtaining the benefits from it.—CAW

The EYES Have It!

Where dyeing is involved, you can believe your eyes only when the samples are compared thru scientifically controlled procedures. Because Berkshire is ready and eager to prove that its products can fill your special needs, it will gladly prepare for you a brochure of comparative test samples, on *any* designated fabrics, under *any* specified conditions.



Berkshire COLOR & CHEMICAL CO.

WHY IT PAYS YOU TO DEAL WITH BERKSHIRE—

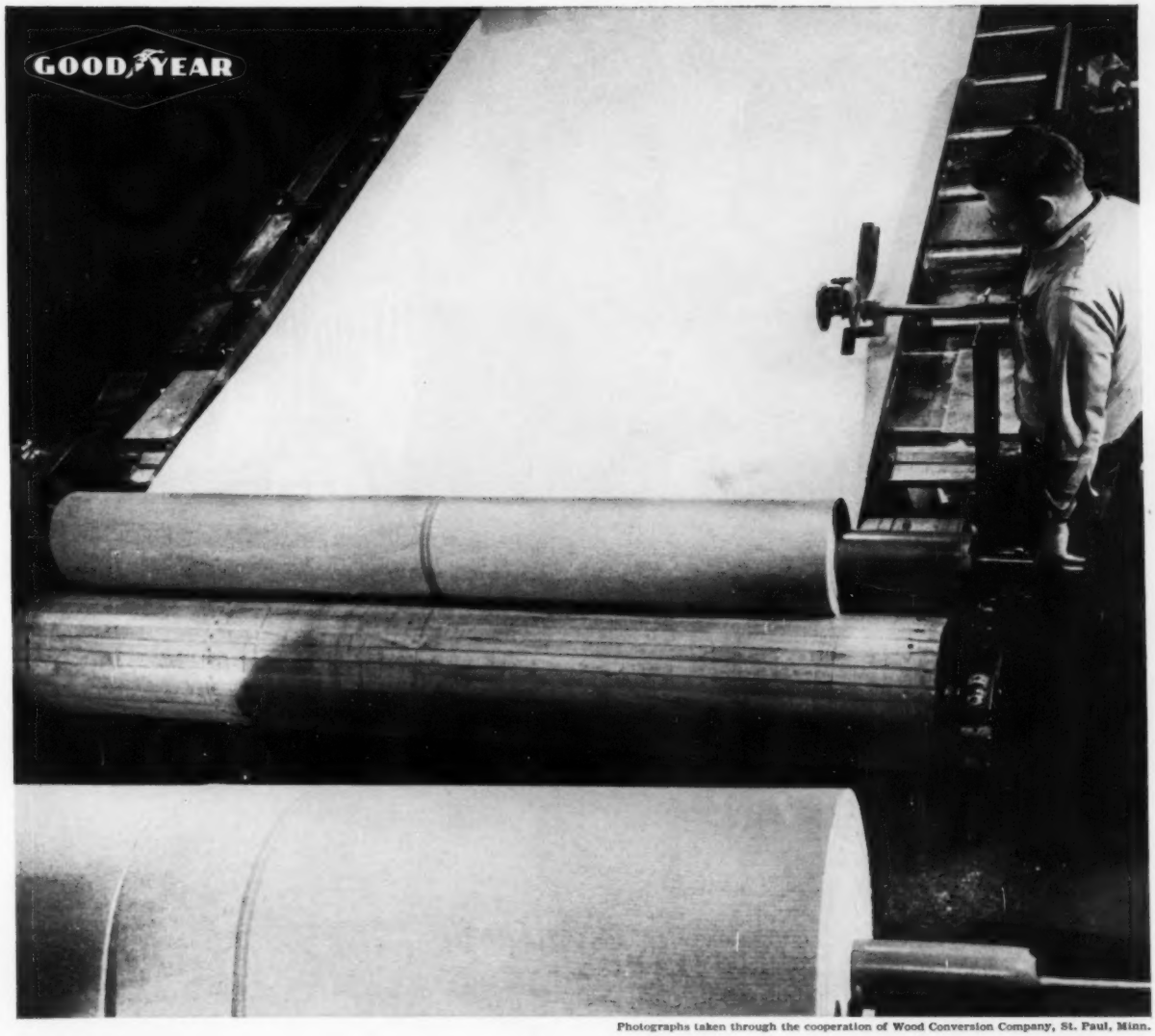
- Specialization — in Dyestuffs, Exclusively
- Completely Unified Manufacturing Plant — from Intermediate to Finished Product
- Ultra-Modern Production, Research and Testing Equipment
- Trail-Blazing Scientific and Technical Personnel
- Successful Product Pioneering
- Individualized Problem Solving Service
- Lightning Delivery—from 4 Strategically Located Warehouses
- Highly Satisfied Customers — as Evidenced by Steadily Climbing Sales Curve

Organized to know your dyeing problems — Equipped to solve them!

Executive Offices—**The 663 Building, Passaic, N. J. 663 Main Ave. (P.O. Box 1076, Passaic, N. J.)**

Manufacturing Plant & Research Laboratories—**Reading, Pa.**

Branch Offices—Charlotte, N. C. (3209 Cullman Ave.)
Springfield, Mass. (210 Albany St.)



Photographs taken through the cooperation of Wood Conversion Company, St. Paul, Minn.

Post another "net" gain for CHEMIGUM LATEX!

A more durable spring insulator, or pad backing, was what this cellulose cushioning manufacturer was looking for.

He achieved it, easily and economically, by rubberizing the high-quality cotton net back of the high-quality cushioning with CHEMIGUM LATEX. This not only improved its strength and wear-resistance substantially, but provided a nonskid surface which also is important to cushioning durability. CHEMIGUM LATEX was chosen for its superiority in these properties plus its ease of processing, particularly in the calendering operation.

What can your product gain from CHEMIGUM LATEX? Find out by writing for details, including the latest *Tech Book Bulletins,* to Goodyear, Chemical Division, Dept. G-9410, Akron 16, Ohio.

Lots of good things come from

GOODYEAR
CHEMICAL DIVISION

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

NEW COLUMBIA-SOUTHERN H_2O_2 BLEACHING PROCESS SAVES TIME AND SUPPLIES ON COTTON HOSIERY

Barberton, Ohio—Research into improved applications for Columbia-Southern Hydrogen Peroxide is paying off for many hosiery mills in sharply reduced bleaching time and lower cost of supplies. Full-white bleached goods are being produced at lower total costs and with higher finished strengths, in just one hour compared to former cycles up to five hours.

Best of all, mills find they can put the Columbia-Southern process right to work in existing equipment without additional expense or delay.

Because each company has its own set of conditions—water, amount of soil in goods before scouring, equipment and workload—we invite you to call in your PPG-Chemical Division representative. He can make specific recommendations to help you save time and money. Of course, he's also ready and qualified to give expert guidance on shipment, storage and handling of such textile processing chemicals as hydrogen peroxide, soda ash, caustic soda and chlorine.

columbia | southern chemicals

CHEMICAL DIVISION

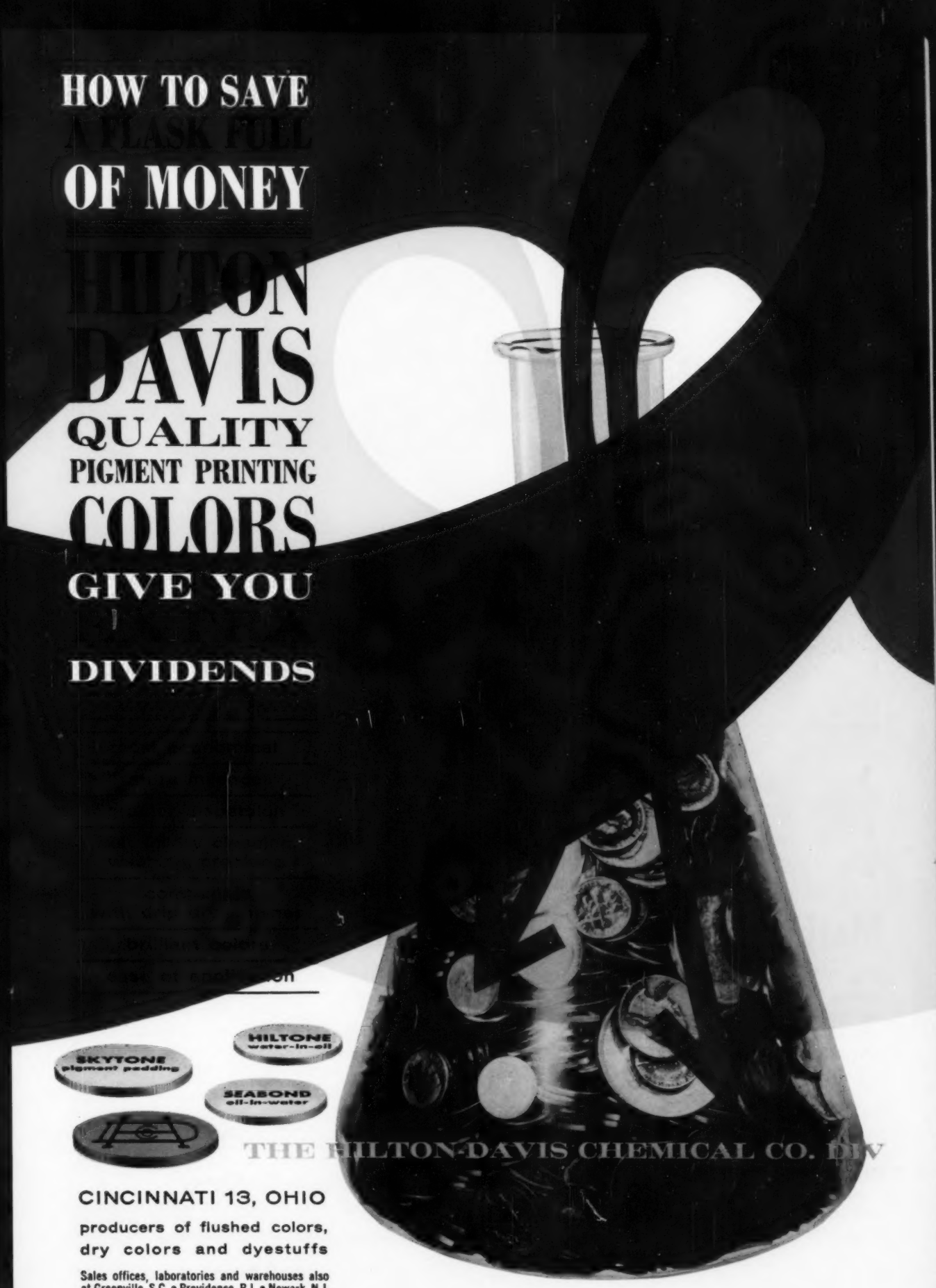
PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER PITTSBURGH 22, PENNSYLVANIA

DISTRICT OFFICES: Boston • Charlotte • Chicago • Cincinnati • Cleveland Dallas • Houston • Minneapolis • New Orleans • New York • Philadelphia Pittsburgh • San Francisco • St. Louis • IN CANADA: Standard Chemical Limited

HOW TO SAVE A FLASK FULL OF MONEY

HILTON-DAVIS QUALITY PIGMENT PRINTING COLORS GIVE YOU DIVIDENDS

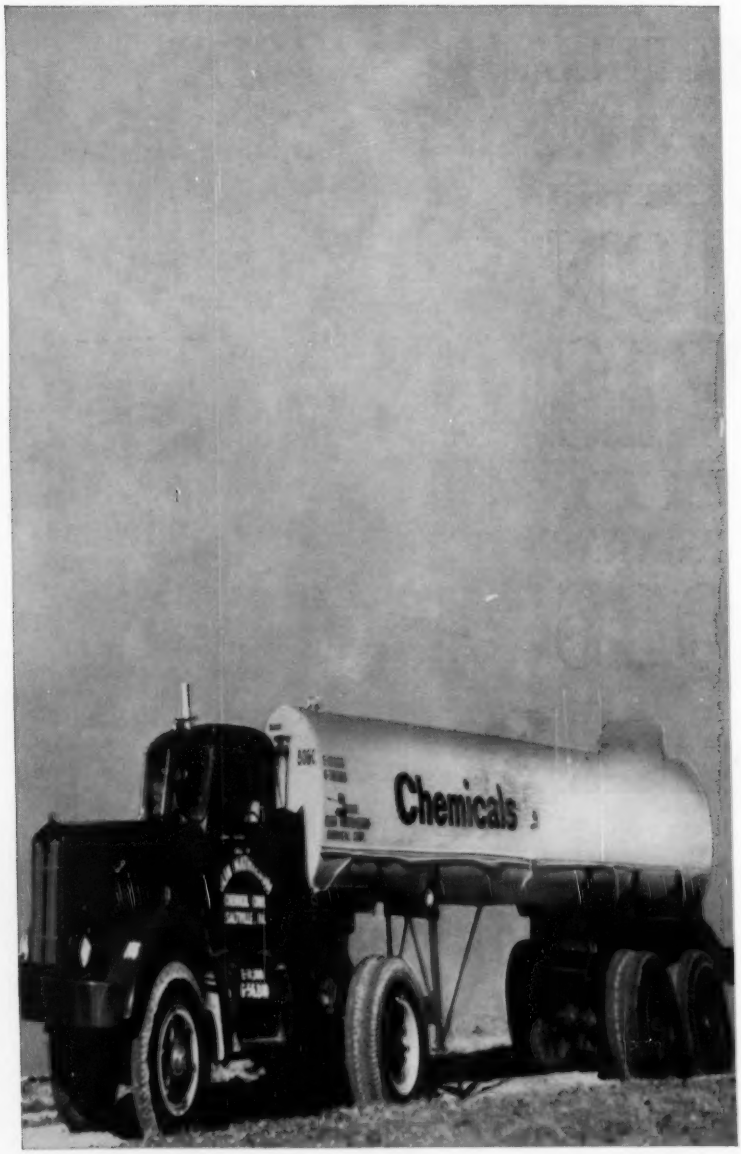


THE HILTON-DAVIS CHEMICAL CO. DIV

CINCINNATI 13, OHIO

producers of flushed colors, dry colors and dyestuffs

Sales offices, laboratories and warehouses also at Greenville, S.C. • Providence, R.I. • Newark, N.J.



Mathieson SQUEEZES your caustic delivery costs

How? Many ways. For example, in most areas, you can order 73% Mathieson caustic soda by truck. The benefits to you are obvious. This concentrated solution means fewer deliveries, less shipping weight, less transportation cost. And only Olin Mathieson offers you this convenient truck delivery.

More ways Mathieson squeezes delivery costs? Location. Mathieson has eight producing plants and shipping points (with a ninth under construction) covering the industrial South and East, with barge, rail or truck shipments to suit your needs. Convenient truck scheduling: we time deliveries when you need them. Service: as you have a right to expect, it's part of company policy, backing every Mathieson chemical with technical assistance. For full details, write OLIN MATHIESON, Baltimore 3, Maryland.

Ammonia • Carbon Dioxide • Caustic Soda • Chlorine • Hydrazine and Derivatives • Hypochlorite Products • Methanol • Muriatic Acid • Nitric Acid • Soda Ash • Sodium Bicarbonate • Sodium Chlorate • Sodium Chlorite Products • Sodium Methylate • Sodium Nitrate • Sulfur (Processed) • Sulfuric Acid • Urea 8947

CHEMICALS DIVISION Olin

A B C

Simplicity . . .

No dyestuffs are more simple in use than the Procion* range.

IN DYEING Procions can be used in a variety of hot and cold processes from simple cold batch to continuous high speed methods. No special equipment is required.

Economical Procions are fast to light, washing and perspiration. The remarkable shade range and brilliance of color are PROCION exclusives.

PROCIONS recommended for **MAXIMUM ECONOMY:**

PROCION YELLOW 4RS • **PROCION YELLOW GRS** • **PROCION BRILLIANT RED 5BS**
PROCION BLUE 3RS • **PROCION BRILLIANT ORANGE 2RS** • **PROCION BRILLIANT RED 8BS**

Quality AHCO PRODUCTS Integrity

ARNOLD, HOFFMAN & CO. INCORPORATED
55 Canal Street, Providence, Rhode Island • Est. 1815
A Subsidiary of Imperial Chemical Industries Limited, England
West Coast Representative: Chemical Manufacturing Company, Incorporated of California

182-1

ICI

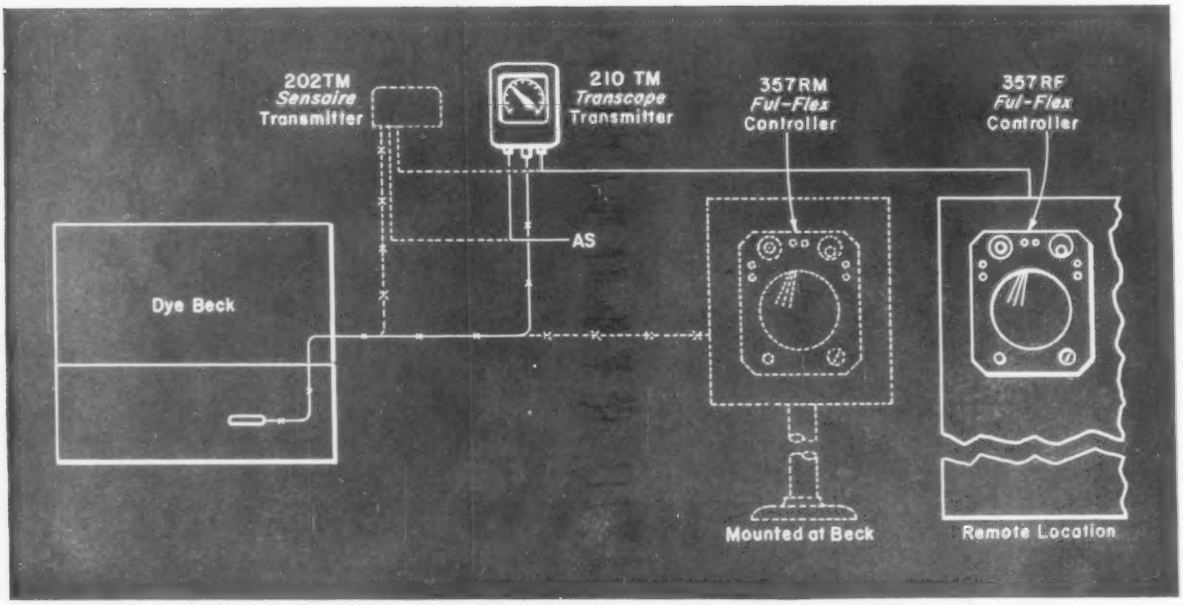
PROCION*

dyes for
increased economy:
high fastness:
widest shade range

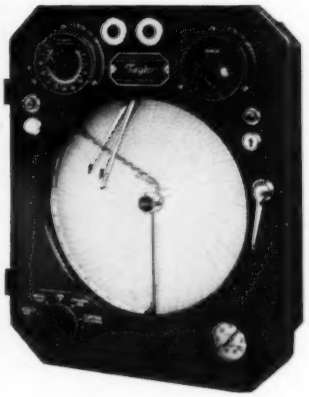
* *Patented in the main industrial countries.*

Developed by Imperial Chemical Industries Limited.

3 WAYS TO CONTROL A DYE BECK



1. **FUL-FLEX* Controller** at remote location, receiving signal from 202TM SENSAIRE* Non-indicating Temperature Transmitter.
2. **FUL-FLEX Controller** at remote location, receiving signal from 210TM TRANSCOPE* Indicating Temperature Transmitter.
3. **FUL-FLEX Controller** mounted at Dye Beck.



With the versatile Taylor FUL-FLEX Dye Cycle Controller you have the choice of centralized control — right in the boss dyer's office if you wish — or control at the dye beck. And whichever system you decide on, the FUL-FLEX controller will give you as much or as little automatic control as you require.

In addition to the features listed here, a FUL-FLEX controller gives automatic rate-of-rise protection. The rate of rise as originally set can never be exceeded, regardless of steam pressure fluctuations.

Whether you're doing piece, package, beam, top or skein dyeing, this outstandingly successful dye cycle controller will give you:

Improved quality through greater uniformity of shades.
Reduced operating costs through elimination of human error.
Increased production through quicker matching of shades, fewer add periods.

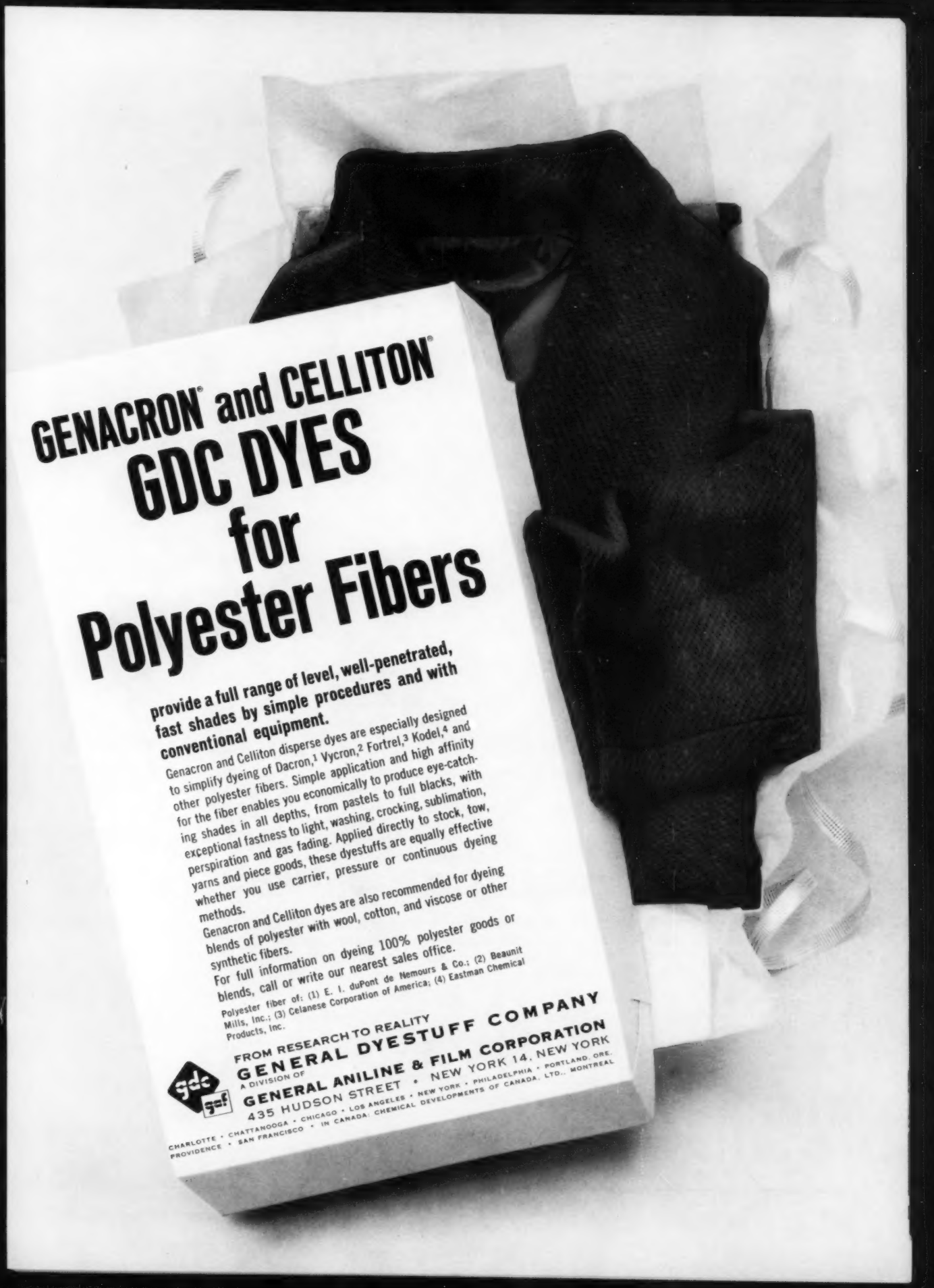
Ask your Taylor Field Engineer for a demonstration, or write for **Bulletin 98339**. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Ont.

FULFLEX FEATURES

- Adjustable starting temperature
- Adjustable initial hold time
- Adjustable rate of rise
- Adjustable hold temperature
- Adjustable hold control times
- Adjustable add periods
- Adjustable forced cooling
- Adjustable end temperature
- Adjustable automatic rinse

*Trade-Mark

Taylor Instruments **MEAN ACCURACY FIRST**


GENACRON® and CELLITON®
GDC DYES
for
Polyester Fibers
provide a full range of level, well-penetrated, fast shades by simple procedures and with conventional equipment.
Genacron and Celliton disperse dyes are especially designed to simplify dyeing of Dacron,[1] Vycron,[2] Fortrel,[3] Kodel,[4] and other polyester fibers. Simple application and high affinity for the fiber enables you economically to produce eye-catching shades in all depths, from pastels to full blacks, with exceptional fastness to light, washing, crocking, sublimation, perspiration and gas fading. Applied directly to stock, tow, yarns and piece goods, these dyestuffs are equally effective whether you use carrier, pressure or continuous dyeing methods.
Genacron and Celliton dyes are also recommended for dyeing blends of polyester with wool, cotton, and viscose or other synthetic fibers.
For full information on dyeing 100% polyester goods or blends, call or write our nearest sales office.
Polyester fiber of: (1) E. I. duPont de Nemours & Co.; (2) Beaunit Mills, Inc.; (3) Celanese Corporation of America; (4) Eastman Chemical Products, Inc.
FROM RESEARCH TO REALITY
A DIVISION OF
GENERAL DYESTUFF COMPANY
GENERAL ANILINE & FILM CORPORATION
435 HUDSON STREET • NEW YORK 14, NEW YORK
CHARLOTTE • CHATTANOOGA • CHICAGO • LOS ANGELES • NEW YORK • PHILADELPHIA • PORTLAND, ORE. PROVIDENCE • SAN FRANCISCO • IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL
gdc
gaf

One of a series

"WHO WANTS A CHEESE FINISH FOR COTTONS?"

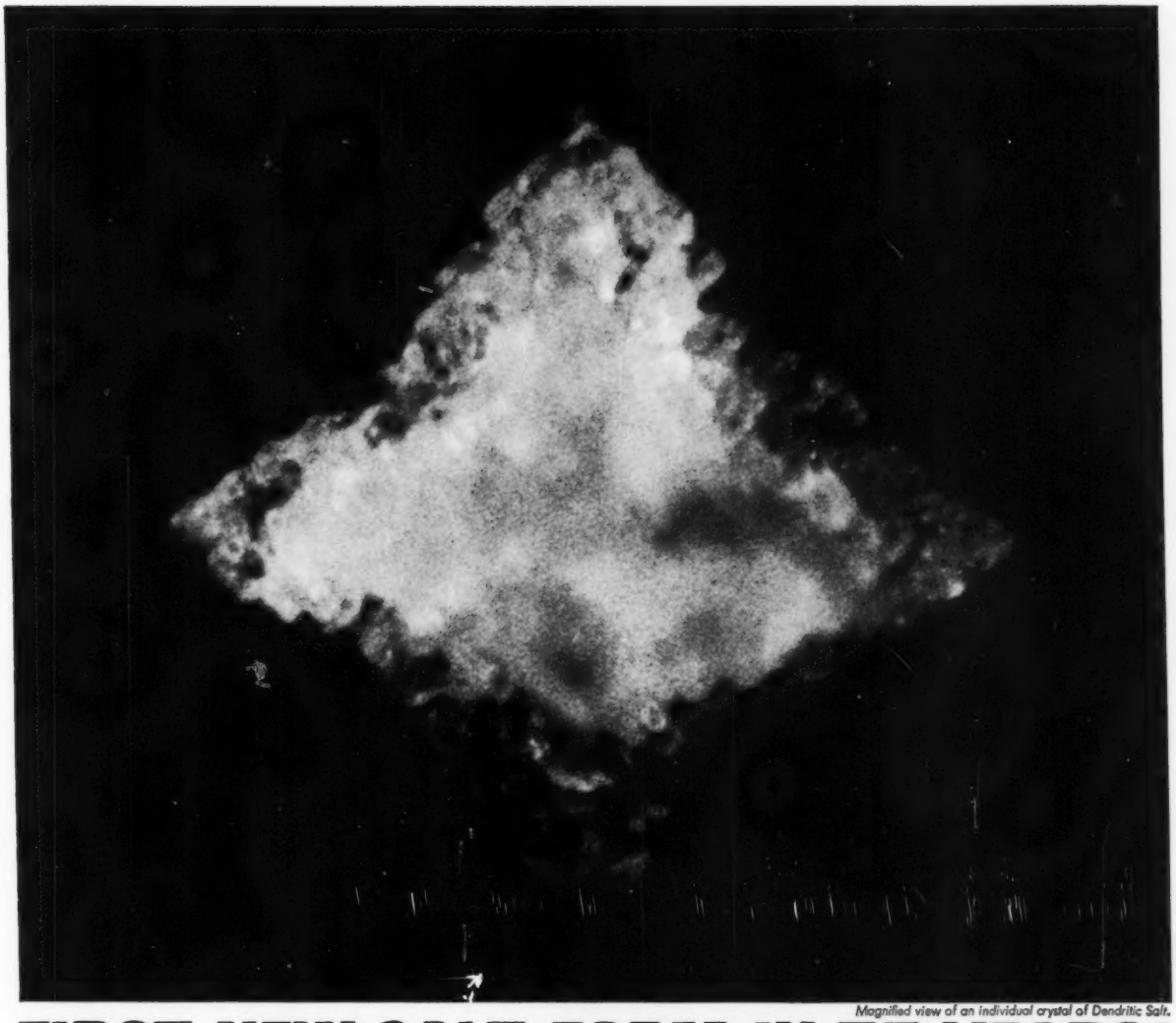
These words were elicited on finding some long neglected emulsions behind the Instron in the QC lab. A roquefort grew on one. What grew on the others was even worse.

Speaking of cheese, ***Bacillus brevis*** is a bug with marked morphological similarity to a cheese bacterium named *Tyrothrix.* So when a potent antibiotic was isolated from ***B. brevis,*** it wasn't too illogical to call it Tyrothricin. We bring this up because Wallerstein happens to be the prime producer of Tyrothricin. (And here you thought our only products are Rapidase® and Serizyme®!) We make other antibiotics, too, as well as enzymes of medical and pharmaceutical interest. In fact, the name Wallerstein is as meaningful in pharmaceuticals as it is in textiles. But what is the meaning for you? This: the search for new enzymes to be used in pharmaceuticals — and in beer and paper, too, to name a few other of our interests besides textiles — fills our shelves with commercial, development and experimental enzymes of many descriptions. Purity ranges from AR grade on down. Some of these enzymes may be just what an imaginative textile man needs to help out with a particularly knotty problem in research or production.

Interested? Drop us a line detailing your requirements. We may be able to send you one or two enzymes of more than casual interest.

WALLERSTEIN COMPANY
Division of Baxter Laboratories, Inc.
Staten Island 3, N.Y.

Interested in using an enzyme preparation to solubilize alginates? Write Dept. R-3.



Magnified view of an individual crystal of Dendritic Salt.

FIRST NEW SALT FORM IN 75 YEARS!

DENDRITIC* SALT! A FINE VACUUM PAN SALT WITH FLAKE SALT CHARACTERISTICS AVAILABLE ONLY FROM MORTON!

Now Morton, and *only* Morton, offers an entirely new kind of fine salt—Dendritic Salt. Dendritic Salt is a vacuum pan salt characterized by irregular, eight-pointed, star shaped crystals that are completely unlike either cube or conventional flake type crystals.

Dendritic Salt's unique shape offers unique advantages:

- ✦ It is as fine as granulated salt, yet as light as fine flake salt.
- ✦ It is one of the fastest dissolving salts produced.
- ✦ It has high capacity for absorbing moisture without apparently becoming wet.
- ✦ Outstanding non-caking properties even under humid storage conditions.
- ✦ It is an ideal bulking agent, and blends exceptionally well.

Dendritic Salt is made from high purity brine—it contains less than 100 ppm Calcium and Magnesium impurities and it is economically priced. Get complete information on the important new Morton exclusive today!

**U.S. Patent 2,642,335*

Please have a Morton representative give me information on new Morton Dendritic Salt immediately.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. AD-7 110 N. Wacker Drive, Chicago 6, Ill.

Carbanthrene® Scarlet RBB paste

Vat Red... with a bright new flair for fashion!

New from National Aniline! And timed to provide a bright, clear base for the cycle of pink shades that are currently coming into vogue.

Carbanthrene Scarlet RBB Paste is one of our controlled fine-particle vat dyes recommended for all types of dyeing, but especially for the clean results achieved in all pigment impregnation methods. It is practically unaffected by metals in the dyebath.

This new vat dye combines good resistance to light with very good-to-excellent wet fastness and is particularly suitable for crease-resistant dress goods and suitings.

Write for samples and Bulletin No. 449

American Designer Series

Hannah Troy

... designed this two-piece dress in rayon crepe, calls the shade Shrimp. It's typical of currently popular pinks that get their good start with Carbanthrene Scarlet RBB Paste.

NATIONAL ANILINE DIVISION

40 RECTOR STREET, NEW YORK 6, N. Y.

Atlanta Boston Charlotte Chicago Dallas Greensboro
Los Angeles Philadelphia Portland, Ore. Providence San Francisco

In Canada: ALLIED CHEMICAL CANADA, LTD.,
1438 City Councillors St., Montreal 2 100 North Queen St., Toronto 18

Distributors throughout the world. For information:
ALLIED CHEMICAL INTERNATIONAL • 40 Rector St., New York 6, N. Y.

Allied Chemical

DEVOTED EXCLUSIVELY TO TEXTILE WET PROCESSING

ADR

Specially Contributed

KINDS OF "NEBS" IN DYED COTTON PIECE GOODS*

CHARLES F GOLDTHWAIT, RACHEL L WILES, and VIRGINIA RUIZ VON SALES†

The Department of Textile Chemistry, School of Textiles
North Carolina State College, Raleigh, NC

The neps that cause the most complaints are probably those that go through the cotton manufacturing processes into finished cloth and appear as light-dyed specks. Complaints had also been received recently on dark-dyeing specks in cotton piece goods. In order to determine the nature of such defects, hundreds of dark-dyeing and light-dyeing specks taken from fabrics dyed differentially or by large-scale methods were examined under the microscope. Differential dyeing is particularly favorable to distinguish between mature and immature fibers. Neps which show as light specks are usually colored green in differential dyeing and, whether present in experimental or commercial fabrics, were caused essentially by immature fibers. No neps were found to consist entirely or mainly of mature fibers, and very few to contain deformed or abnormally large fibers. Many mixed neps contained mature fibers, or fuzz fibers (linters) from fragments of seed coat, but sufficient immature fibers were also present to have (probably) caused the formation of these neps. The dark-dyeing specks were invariably such linters, frequently with bits of seed coat still attached. True neps were, as a rule, also present in the recent fabrics, as shown by stripping and redyeing differentially. These had, however, been covered in the practical dyeing, usually with vat colors; mercerizing before dyeing was an apparent advantage. A suitable study of mercerizing and vat dyeing might contribute more certainty to the coverage of neps. The general impression was that present-day handling of cotton may have increased the numbers of seed-coat fragments in piece goods, and of fibers freed from them in bleaching, which tend to show as dark specks in dyeing goods.

INTRODUCTION

NEPS have been mentioned in the textile literature for more than 100 years. The very extensive literature includes reviews of which that by J F Bogdan (*2*) of 1950, is one of the most comprehensive. However, it appeared ten years ago and much has come out since. Although so much has been said, and neps are frequently discussed, there is not yet general agreement in their descriptions, and certainly not as to their causes. The realization that the cause of neps was not fully understood prompted a continuation of study at The Textile Research Center of North Carolina State College along new lines.

According to the ASTM (*1*), a nep is "one or more fibers occurring in a tangled and unorganized mass". This definition no doubt had most careful consideration and the resulting broad and indefinite statement reflects the difficulty of defining neps. Fibers on bits of seed-coat were definitely excluded as not being neps.

The late Norma Pearson, who probably studied neps more than any other individual, said (*8*): " . . . the term 'nep' is applied to small aggregates of fibers tangled together to a degree that is sufficient to allow the entire knot to be separated from the surrounding fiber mass". This definition does not specify any particular kind of fibers, but she said that in the majority of neps thin-walled fibers form the basis of the entanglement. Further, " . . . in general usage the term 'nep' designates only small tangled knots of fibers." In spite of this rather simple statement, Pearson described 15 kinds of neps found in raw cotton, or in yarn. This work did not extend to neps in cloth.

According to their origin, neps have been distinguished as "natural", those found in ginned cotton (obviously not quite natural), and "artificial" or "processing" neps which are produced in manufacturing. This distinction was made by F H Bowman as far back as 1881.

As an example of a difference in definitions, Lord (*7*) described five types of neps, composed wholly of balls of entangled fibers, found in cloth. Of these, neps due to immature or dead fibers had been the cause of most complaints regarding neppy piece goods examined at the Shirley Institute. However, Lord included as one of his types the fuzz nep consisting of a tuft of fuzz fibers originally from seed-coat. He also included "process neps" which consisted of tangles of normal fibers of the average maturity of the lot, present solely because of faulty processing. His study included that of neps in cloth dyed with Chlorazol Fast Red K (old CI No. 278) which, coincidentally, is the same dye used under another name in differential dyeing (*6*, Appendix), and on experimental fabrics dyed red to show neps, as described below. Lord examined neps from the dyed cloth under the micro-

*Research supported in part by funds administered by Stanford Research Institute, South Pasadena, Calif, in the name of The James G Boswell Foundation.
†Present address: Guerrero No. 67, Cuernavaca, Mor, Mexico.

scope, but classified the fibers in the neps by their response to swelling in caustic soda, in contrast to our direct examination of the dyed fibers.

Fargher et al (3) expressed about the same views as Lord, and included the point that neps may originate from minute bundles of fuzz hairs derived from or still attached to fragments of seed-coat (apparently considered neps even if not tangled with immature fibers).

While much that is to be said may seem to have been covered, particularly in Shirley Institute publications, the present method of approach is apparently new and some of the fabrics to be considered represent present-day cottons processed under commercial conditions.

The consensus of opinion as expressed in most publications is that immature fibers are essential for nep formation; but, as already seen, other aggregates of fibers which may include none that would be considered immature, have sometimes been called "neps". In the following discussion, neps or "true neps" will refer only to those which consist essentially of immature fibers or seem mainly dependent upon them.

Some investigators have had the apparently logical idea of beginning the study of neps where they originate, but results have been rather confusing. Hence, it was decided here to study first the particular neps which seem to cause the most complaints, those which have survived the usual manufacturing operations, or have possibly been caused during manufacturing, and have come through in the cloth, often to appear as defects after dyeing and finishing. Up until recently most complaints, heard from time to time, concerned light-colored specks in dyed goods. Within the last year more has been heard about specks, sometimes called "neps", that were dark, frequently darker than the color of the dyed piece.

METHODS FOR STUDYING NEPS——— Differential dyeing and the microscope afford the best means found so far for studying neps and other fibers that cause light or dark specks in piece goods when they are dyed.

The differential dyeing technique was published in 1947 (6, Appendix) and is widely accepted as distinguishing immature from mature cotton fibers. As may be familiar, the immature fibers are colored green and mature fibers red if dyed together in the same bath, with a combination of Chlorantine Fast Green BLL (CI Direct Green 26) and Diphenyl Fast Red 5BL Supra I (CI Direct Red 81), followed by a desorption rinse, or partial stripping in boiling water for 30 seconds. This rinse, which is a part of the test, is commonly called "stripping", and is not to be confused with ordinary stripping to decolorize dyed goods. In this test, as mentioned in the original publication, and since found true of various modifications of the test, neps show in cotton as green or light green specks. This is true of cloth whether grey or bleached, or whether it has been dyed, stripped, and redyed differentially. This test has been used by others also for the study of neps, and in finishing plants to assess quality of cloth as dependent upon neps.

The coarse fuzz fibers attached to fragments of seed-coat are usually mature and dye red, but are sometimes immature and dye green.

Several German publications refer to the differential dyeing as the "red-green" test, and one of them discusses neps removed from differentially dyed yarn (9). Of these, 90% consisted of immature fibers and were dyed green; others were described as red but some of the latter, which were mainly of mature fibers, had small green-dyed immature fiber knots within them.

NEPS IN DYED CLOTH———The description of neps found in cloth will begin with those in a few older experimental fabrics, and then continue with examples from recent mill production from several sources. While the main concern is with the neps and other defects, their appearance sometimes tells something also about the effects of dyeing or finishing processes on neps.

Among the fabrics most critically examined were 80 × 80 print cloths made from bale samples of cottons of different degrees of nepping tendency. These cottons were spun and the cloth woven at the School of Textiles of North Carolina State College, then finished in the pilot plant at the Southern Regional Research Laboratory, and reported in considerable detail in 1950 (5). Fortunately, pieces of these fabrics (designated "N-S") were still available for an analysis of neps, which had not been made previously. One of the cotton was a Deltapine 14 of 86% maturity, a good rain-grown cotton. One was an Acala P-18-C of 78% maturity, an irrigated cotton well known at the time for its tendency to form many neps. The third cotton was an early Acala 4-42 which showed an intermediate number of neps.

Parts of the fabrics, each made entirely from one or another of the cottons, had been bleached, and dyed in an essentially practical manner on a jig with Diphenyl Fast Red 5BL Supra I, the same dye used in differential dyeing. Neps appeared in all three dyed fabrics as light specks.

Some of the largest and some of the smallest light-tinted neps were examined at a magnification of 100x. Of representative neps from the three red-dyed fabrics, there were none which consisted entirely of mature fibers, and none that had more than a few stray fuzz fibers (linters). All had immature fibers, usually in a major proportion, and nearly half were almost completely of immature fibers. On the other hand, nearly half of the total number of neps had mature fibers mixed with the immature, or leading through the neps as though they had helped hold them attached to the cloth. There were several neps with one to several unusually large, abnormal fibers tangled with immature fibers. Special search for dark-dyed nep-like specks failed to yield more than one or two per square foot, and of too small size to be important.

All three of these fabrics had light-tinted fibers twisted into yarn and woven into the cloth, of frequent occurrence although not always conspicuous. The microscope showed them to be immature fibers like those in the neps. The neps and other immature fibers came out practically white when a sample of either of the red-dyed fabrics was immersed in boiling water for 30 seconds, while the depth of color of the cloth was reduced about one-half.

A piece of similarly red-dyed sheeting, made from lower-grade cotton, had very light-tinted neps about like those described above, and nearly white fibers that followed the threads. No neps or nep-like tufts of mature fibers were found, but there were a few darker red specks consisting of tufts of fibers from seed-coat. Differential dyeing showed that there were mature fibers in about 60% of the neps.

The fibers in the neps, and other surface specks of fibers in the red-dyed fabrics were difficult to judge under the microscope because nearly all fibers were colored somewhat. Observations of the corresponding specks taken from differentially dyed samples, to be described below, were much more certain.

When portions of the three original N-S fabrics were vat dyed by a pigment pad and reduction process with 1% Ponsol Jade Green B, the neps were much less conspicuous, as though there were fewer of them, but some showed plainly as light specks in all three. When dyed after mercerizing, there were no light specks in a square-yard area of either fabric and it was difficult to find neps. There were a few really dark specks, but few if any more than in the dyed unmercerized pieces. Hence, the mercerization had not caused the initial defects to dye darker than the body of the piece. The result in covering neps was really remarkable, from the combination of mercerizing with vat dyeing. A few dark specks had seed-coat fibers.

Several other fabrics dyed with single direct dyes were inspected. One of unknown history dyed with direct blue was most striking. In addition to the nearly white, round specks which were obviously neps, it had many parallel fibers or slubby groups of near-white color twisted into the yarn in both directions in the piece. A few dark specks had seed-coat fibers.

An 80 × 80 print cloth of more recent origin had been dyed with 2% of a direct fast blue 4GL in an open bath. Of 15 neps and other bits of fiber from it, three consisted of seed-coat fibers but were not especially dark, and would hardly rate as defects. The rest looked light blue in the piece, and were immature-fiber neps, although two-thirds of them had mature fibers which were apparently parts of the neps.

In similarly direct-dyed mercerized print cloth only a few light specks could be seen, and they were shown to be neps. There were more dark than light specks, and dark specks examined consisted of fuzz hairs which apparently came from bits of seed-coat present before the fabric was bleached.

Neps were also studied in print cloths made from cottons of five or six years ago, of similar properties except that one was cavitomic, one rain-grown and one irrigated. Samples of the fabrics were dyed in an ordinary manner with Diphenyl Fast Red 5BL Supra I, then part of each was given the 30-second treatment with boiling water.

When dyed after desizing and scouring, some light neps showed in all three, also a few dark specks, some with bits of seed-coat attached. When stripped in boiling water, the shade went down to half depth or less, and many more neps showed as nearly white specks. There were still some of the relatively dark specks with seed-coat.

When samples which had been bleached were dyed, more neps showed, or neps showed more plainly than before bleaching; very few dark specks remained. Many more neps appeared practically white in all three pieces after hot-water stripping.

Samples bleached and mercerized dyed darker red in the same bath with the others, and only a few neps showed in each, as pink specks. Even after stripping in boiling water, neps were less prominent than in the corresponding unmercerized goods. Fragments of seed-coat had practically disappeared.

Observations on routine differential dyeings of these same fabrics agreed with those on the plain red dyeings, except as determined by the difference in color. Ordinary immature-fiber neps were dyed green as usual; there was no indication of mature-fiber neps; and no indication that seed-coat fragments and dark specks would have been a problem with these cottons. Results from other differential dyeings follow.

DIFFERENTIALLY DYED CLOTH———While neps and darker colored specks from some fabrics dyed direct by ordinary methods could be characterized reasonably well, the constituent fibers could be identified more easily and with more certainty after differential dyeing.

Grey goods dyed thus show green specks against a gray-red background. In a group of fabrics dyed together, the colors of individual samples tend to differ from redder to grayer with increasing immaturity of the cotton, but the neps show equally well. In bleached cloth the neps show in the same way against backgrounds which are considerably less red.

A few immature fibers behave somewhat differently from the rest in dyeing. The three N-S fabrics were dyed differentially, both grey and bleached. In such dyeings, even without any rinsing, there were light specks which consisted of whitish or greenish fibers which had not taken on any appreciable amount of the red dye and only a little of the green. They were not actually white, and more showed on bleached than on grey cloth. There were also occasional dark green specks, which had evidently not taken on red, and occasional light fibers twisted in. Examination of the fibers in a few of the light-colored specks showed them to consist of thin-walled fibers with occasional mature fibers, like other neps reported. They seem to represent immature fibers with different dyeing characteristics from most immature fibers, but further study had to be postponed.

Neps as viewed directly in the differentially dyed and stripped piece goods, differed in appearance. Many were very light green, many others were distinctly darker, and a few much darker yet. Some neps, more of them in the last two groups than in the first, could be picked readily from the surface of the fabric; others required cutting of the cloth and untwisting of the yarn to free them. Although it was obvious that the green specks or neps must consist largely of immature fibers, many were examined for the nature of other constituents. Many neps were so thick and dense as to be nearly opaque under the microscope and had to be spread so that individual fibers could be seen more distinctly. No consistent differences were recognized between the constituents of the neps in the three N-S fabrics made from different cottons.

Little more than a fourth of the neps consisted of immature fibers alone. Of these, the lightest in color were usually of extreme thin-walled fibers; those a little darker in color seemed to have slightly thicker walls; and the few of the darkest green had still thicker walls, but were apparently immature fibers. Such differences in the immature fibers were also found in other neps.

It was clear that all neps contained immature fibers, and were due very largely to them. There was the usual difficulty in trying to classify neps in accordance with other fibers present, because of their considerable variety. Many of the neps had red-dyed (mature) fibers running through them, which probably did not contribute as a cause of their formation. Others, considered to be mixed neps, had tangles of red-dyed fibers which were parts of the neps and may have helped cause them, or possibly the neps helped cause these tangles.

Occasional neps had abnormally large or deformed red-dyed fibers which may, according to some opinions, have contributed to help cause the nep. In such cases, however, the same groups of immature fibers might have formed neps by themselves if the other fibers had not been there. Hence, the latter may be present merely by coincidence, and not as causes of the neps.

Red-dyed neps from yarn, mentioned earlier (9), would necessarily consist of mature fibers, but while tangles of mature fibers have been reported in yarn, they have not been found in any fabrics examined here. If they were present they should be of the same color as the bulk of the material in goods dyed normally, or might be slightly redder than the average in differentially dyed material. In the N-S fabrics so dyed, specks were inspected of about the same color as the background, which apparently had not shown as defects when the goods were dyed with direct red or vat green. All but one or two out of 25 had immature fibers but some had linters from seed-coat particles, mature fibers, or fibers of abnormal size and shape, in such combinations that the overall color was not green. However, there were no mature-fiber neps. There were also minute tufts of fibers frequently of similar size to large neps, but darker in color than the body of the piece. These consisted of fibers, really linters, that came from seed-coat fragments, or might be still attached to them. There were hardly enough of them to be noticed as defects.

From experience with complaints extending back 10 or 12 years, the fabrics described above were typical. The complaints had invariably been on light-dyeing fibers (specks) which examination had shown to be neps, whether in yarn or in fabric.

DARK-DYEING SPECKS———The more recent complaints on dark-dyeing specks are illustrated by ten examples. The earliest of them was a polished cotton of two or three years ago, from a department store. It showed no neps but had dark specks on the face of the medium blue piece. The specks consisted of coarse, tangled fibers which apparently originated from seed-coat.

Four fabrics from a finishing plant, two light in shade and two dark, showed dark specks, while light-colored specks were practically absent. A few white spots on the darker colored pieces were obviously due to minute areas on the surface of the cloth having been cover sufficiently by loose surface fibers to cause resisting while the cloth was being dyed. This made small defects, nep-like in appearance, but certainly not neps.

The dark specks were so similar in composition in the four fabrics that they can be described together. About three-fourths of those examined were readily picked from the cloth surface. Of 75 dark specks viewed under the microscope, almost 90% were mainly or entirely due to seed-coat fibers, some of which on the dark colored fabrics were still associated with bits of disintegrated seed-coat. The remaining 10% did not form a clear-cut class.

Samples of these fabrics were stripped with hydrosulfite and caustic soda to shades light enough for differential dyeing. After dyeing by the second method (Appendix) there were distinct green specks which were confirmed as immature-fiber neps, but there were relatively few of them.

A fifth piece, a mercerized and vat-dyed gray twill, had similar dark specks but more of them, and no light neps. When stripped to a light gray and dyed differentially, there were a few light specks which were found to be the usual immature-fiber neps.

All five differentially dyed samples came out much greener than most such dyeings. This may have been partly due to the severe stripping but seems mainly due to the cloth having been mercerized. The absence of visible neps in the original dyed pieces also resulted partly, at least, from mercerization of the cloth.

The obvious tendency had been for either the mercerization or the vat dyeing, and probably both, to contribute to the covering of the neps so that they did not appear as visible defects. On the other hand, mature fuzz fibers, or linters, originating from minute fragments of seed-coat, were the main cause of the dark specks which appeared as surface defects in the original dyed pieces.

Four cloth samples from another source showed objectionable dark specks or small tufts of surface fibers, but no light specks of typical nep appearance. Although these samples represented raw stock or piece dyeing with sulfur, vat or naphthol colors, the observations were rather similar for all of them. Many of the dark specks were examined and most of them found to consist essentially of linters, frequently with bits of seed-coat attached. They were not dark-dyed neps.

In one case the cloth had been mercerized and vat dyed; the differential dyeing test helped to show the presence of neps, but they had been well covered by the mercerizing and the dyeing with a vat blue. In another case, mercerization and dyeing with a sulfur brown had covered the neps. Stripping by chlorine bleach and then dyeing differentially showed relatively few green-dyeing neps, apparently because the mercerization had caused many of them to be covered even in the dye test.

Two other pieces were made from cotton dyed as raw stock. There was no mercerization, but the neps in these dyeings by sulfur black, sulfur gray, and naphthol red were well covered. That neps were present was shown by stripping the original colors from the cloth and dyeing differentially. There were then many typical green-dyed neps, composed mainly of immature fibers.

COVERING NEPS IN DYEING———As reported incidentally in the previous paragraphs, true neps had been colored apparently normally under several conditions of dyeing in finishing plants.

In another case of fabrics not mercerized, the neps were so well covered as to obscure differences in numbers of neps produced in test fabrics. Specifically, a group of fabrics made from three cottons of different fineness and nepping capacity, and each processed by itself in several lots so as to show nepping to different degrees, became available for study of the neps. These fabrics had been manufactured and dyed on a large enough scale to represent commercial processing. Nep counts in the card webs had increased from cotton to cotton with Micronaire fineness, and had increased for each cotton through a considerable range of rates of carding. When made into a rather heavy twill and dyed with vat blue, differences between numbers of neps in the pieces could hardly be seen, although the dyeing had been expected to show rather clearly that there were differences.

The neps failed to show notably lighter than the body of the pieces, but, in contrast, there were loosely attached bits of fiber on the surfaces of all the pieces, some of about the same depth of color as the cloth, and some darker. Ten of these specks from each of six fabrics were examined under the microscope and found to consist mainly of coarse fuzz hairs, or linters, from fragments of seed-coat, occasionally with bits of seed-coat still attached; or to contain enough linters to indicate that they helped cause the defects. About one out of ten were not linters, were not alike, and were not readily characterized.

Cloth made from one of these cottons had many more dark specks at the highest rate of carding than at

the lowest rate, and more than cloth from the other two cottons. The larger number of specks, following the high carding rate of the one cotton, indicated that when there are excessive numbers of fragments of seed-coat, more may come through when crowded in the card.

Since it seemed that many more neps must have gone through into the fabrics than appeared to be the case from the original dyeings, samples of the grey goods were dyed differentially by the second formula (Appendix). The neps then showed in the different pieces to degrees which seemed to correspond with the great differences in nep counts on the card webs.

The differentially dyed pieces differed in shade from red to gray-red in accordance with the increase in fineness, or apparent decrease in maturity of the cottons. The neps showed as green specks of different depths of color. Some green fibers, of the same color as the neps, were woven in with the yarn.

In these cottons the "extra" neps at the higher carding rates were dyed green, not red or not like the ground color as they should have been if they were mature-fiber, manufacturing or process neps. This raises a good question as to the distinction between natural or growth neps and process neps. It would seem that a great share of the immature-fiber neps in the pieces representing cotton carded at a high rate should also be called process neps. Parts of the same lots of cotton with the same kinds of fibers had been run also at the lowest rate of carding, but there were many less neps in the cloth. Perhaps fibers capable of forming neps did not produce neps until they were crowded in carding.

As a confirmation to make the evidence more convincing that the neps were present in the cloth all the time, samples of he original blue dyeings were stripped by caustic and hydrosulfite to a light ground, and then dyed differentially. Neps which had been covered by the blue appeared now as the usual green-dyed specks in corresponding numbers to those in the previous differential dyeings of the same materials. Examination of many of the neps showed them to consist essentially of immature fibers. A few had mature fibers that appeared to belong to the nep. These neps were like neps found in various other fabrics. There were darker specks also on these differentially dyed samples, more like the ground color of the cloth. Representative dark specks from the pieces which corresponded with the highest carding rate for all three cottons, consisted entirely of bits of seed-coat with linters attached. Most of the linters were mature (dyed red) but some were thin-walled or immature (dyed green), and some specks contained fibers of both colors.

There was one especially clear case of covering neps by vat dyeing following mercerization in which undyed cloth from several process steps was available so that it could be tested by differential dyeing. This test showed many neps present in the grey cloth; and they were even more plainly visible after bleaching. Examination of representative neps showed them to be of the usual typs, based mainly on immature fibers. In contrast, after mercerizing the cloth appeared to have but very few of the neps that were shown to be present by the other two dyeings. Mercerization had caused them to cover better with the direct green used in differential dyeing, but the vat dyeing in the finishing plant did even better, and there were virtually no neps showing as light specks. That is, the mercerization and vat dyeing together had eliminated them as defects, but there were loosely attached dark specks, and they proved to be composed mainly of linters from fragments of seed-coat. As somewhat exceptional observations, the apparent neps in the differentially dyed mercerized cloth were very difficult to separate from the fabric, and more of them proved to be green-dyeing linters than ordinary immature-fiber neps. The nature of the few nep-like specks that are found under these conditions needs further study.

DISCUSSION

The observations recorded herein may seem not to agree with some of the published information about neps. This may be partly because most of the prior work has been done on cotton in some form other than cloth; partly on account of differences in the cottons studied; or quite possibly, in part, because of changed conditions since reports of 10 to 25 years ago. The present discussion has been limited to neps that have come through into cloth, and no other similar recent data are known for comparison.

Neps have been variously described as rarely occurring of mature fibers or immature fibers alone, and as containing a number of kinds of abnormal fibers. In agreement with the first, practically no neps which could be definitely identified as consisting entirely of mature fibers have been found. On the other hand, in disagreement, many that must be considered to consist entirely of immature fibers have been observed. Abnormal fibers, given great importance in some discussions, were few in number and considered as not important in causing the neps found in the fabrics examined. Mature-fiber neps, if present, would be considered process neps. However, some of the neps of immature fibers, and some mixed neps may have been process neps.

In a special search in the N-S differentially dyed fabrics there were less than 1% of mature-fiber neps, and they were not clearly distinguishable as such. This point is emphasized because mature-fiber neps have apparently been considered serious in the past.

In published discussions on neps little has been said concerning fibers similar to those in neps but lying along the yarn rather than appearing as specks. They have been of different depths of green in defferentially dyed cloth, and of light tints or nearly white in some of the worst cases in cloth dyed with direct colors. They evidently came off the seed in groups of parallel fibers, were not separated, and were laid approximately parallel to the run of the fibers in the yarn, were more or less twisted into it, and were finally woven into the cloth. Sometimes they are especially prominent if present in a form resembling slubs. One may show on both sides of the piece, and may show as a row of dots along the warp or filling thread between points where it is crossed by the threads in the other direction in the piece. Such defects have been found in both experimental and commercial print cloths and sheetings. When examined microscopically, these fibers have been found to be of the same types as some of the more substantial of the thin-walled fibers found in neps. They may seem not to come under some definitions of neps although they differ from most neps only in size and shape. They should, therefore, be covered in dyeing by the same dyes and methods as neps.

On the assumption that all fibers in a dyed lot of cotton have equal amounts of dye per unit of weight, it has been pointed out that, as an effect of fineness alone, the immature fibers (British, "dead") will look lighter than the normal mature fibers, and that the course, usually mature, fuzz fibers will look darker. There is undoubtedly this tendency for optical reasons, but these

alone do not fully explain some of the differences that are observed. Examples have just been described where it was difficult to find neps in dyed goods, although many were shown afterward to be present. The optical explanation is not sufficient for some of these original dyeings.

Experience so far suggests the question whether an apparent change of emphasis from light-dyeing neps to dark-dyeing fuzz hairs is a real change, sufficiently general to represent something new, or something that has merely happened a number of times. If it is something that has been developing, further questions can be raised as to whether it is a result to be expected from changes in cotton and its handling, or a result of the development of more favorable dyehouse techniques.

Some dyeing processes have covered neps, even though the somewhat pessimistic opinion was expressed eleven years ago (*3*) that if "dead cotton nep is covered in technical dyeing, it should be regarded as a fortunate, but accidental, circumstance and should not be taken to imply that the dyer can or should cover he nep." This may still be true to a degree, but the present report shows that neps are frequently being covered and sometimes very effectively, although under some circumstances the difficulty of dark specks has appeared.

WHAT CAN BE DONE ABOUT NEPS?———This work was begun as a study of virtually random samples of cloth to determine the nature of the neps found in them. Inquiries regarding defects in commercial piece goods caused it to be extended to samples which showed few neps but had dark specks instead of light-dyeing neps. The dark specks have sometimes been regarded as dark-dyeing neps, and sometimes recognized as consisting of fibers of seed-coat origin, as found in this investigation.

The initial plan did not include any study of what to do about neps. However, the observations already described have given some idea of what might be done, or have confirmed earlier suggestions from different sources or from practical experience. Some bits of fiber look as though they could have been brushed off; some were obviously too large or too dense to have singed off. The dark-dyeing specks are in the cotton as received at the mill and if they cannot be taken off the cloth mechanically, the remedy must be sought far ahead of the finishing plant.

As to the true neps, mercerization has long been recognized as helping to cover them. It was shown to be quite effective with the fabrics made from the three N-S cottons described above (*5*). Far fewer neps showed when the fabrics had been mercerized before dyeing with the direct red, which tends to show neps so prominently in unmercerized cloths. The neps were practically invisible in pieces of these same fabrics which had been dyed vat green after mercerizing; and there was only an occasional speck darker than the rest of the piece.

Opinions seem to differ as to the kind of mercerizing required. Some plants have favored the usual full strength of mercerizing caustic soda, even though other effects of mercerizing are not always desirable; others have employed so-called half mercerization with approximately half-strength caustic. There may not be any general rule. It has been noted (*3*) that mercerizing to help conceal neps may make fuzz fibers show more plainly. There were not enough fuzz fibers in fabrics available for experiment to contribute to a decision regarding this point. It would require checking under plant conditions.

Examples were given above of the coverage by finishers of neps by vat or other dyes on mercerized or unmercerized cloth. It was certainly possible in those cases. Not enough is known about them, nor has enough been done here for more specific suggestions. No doubt much is still to be learned at finishing plants on such details as the utility of individual dyes, possibilities for complete color lines, and the importance of mercerizing in combination with the dyeing.

Direct dyeing by batch processes has probably caused most dye trouble with neps in the past, and the manner of washing after dyeing is important. This is clearly implied by the results of the hot-water treatment of differentially dyed material, which removes most of the red from neps although it leaves them colored with the green dye. In special stripping tests by hot water, neps seemed to lose their color more readily than the bulk of the cotton. Hence, if the neps are colored initially, the goods containing them should have a minimum of washing, and with cold water.

Furvic (*4*) concluded from desorption experiments that direct dyes are more rapidly removed from immature than from mature fibers; and reported that neps showed more in the cloth if it was rinsed in warm instead of cold water.

The results of differential dyeing tell us also that some direct dyes color neps better than others. This was shown even more clearly when fabrics of familiar nep content were dyed with Diphenyl Fast Red 5BL Supra I and with Chlorantine Fast Green BLL separately, to similar depths of shade, and then dipped into boiling water for 30 seconds. Dyeings of the red showed a few nearly white neps, but after the hot water, the color of the piece was reduced one-half or more, and there were many white or nearly white neps. The green dyeings also showed an occasional nearly white nep, two or three to a square foot of cloth. The color of the piece was reduced a fourth to a third by the hot-water treatment but only a few more neps showed—as very small specks, hardly white. The neps had been covered by the green much better than by the red, and were much less noticeable.

While such differences in results with direct dyes can be demonstrated, the coverage of neps by proper selection and use of direct dyes has either not been widely successful in the past, or has not had sufficient research attention. Some finishers have obtained some excellent results with other dyes, as far as neps are concerned, but it seems that this part of the subject is not well understood. The results reported suggest that if the latter is true, investigations need to be extended to cottons of known properties, typical of present-day cottons, from gin through finishing plant. Anything found possible should be done to reduce the number of seed-coat fragments. Elimination of neps might not be so important if they could be covered in dyed goods. Systematic studies should be made, necessarily very largely with plant equipment, to determine the ways in which dyeing to cover neps can be done most successfully.

SUMMARY

Neps found in various experimental and commercial fabrics consisted essentially of immature fibers, but were not limited to the extreme fibers with practically no wall thickening, which have seemed to be the worst offenders. Many neps that consisted entirely of immature fibers were found, but none entirely of mature fibers. There were many mixed neps, in some of

(concluded on page 54)

DIHYDROXYETHYLENEUREAS AS WRINKLE-RESISTANCE FINISHING AGENTS FOR COTTON*

SIDNEY L VAIL, PAUL J MURPHY JR, J G FRICK JR, and J DAVID REID

Southern Regional Research Laboratory[1]
New Orleans, Louisiana

The ring hydroxyl groups of 4, 5 dihydroxy-2-imidazolidinones (dihydroxyethyleneureas) have been shown to be chemically active and to produce crosslinks similar to those produced by conventional N-methylol crosslinking agents.

The properties of fabrics treated with some dihydroxyethyleneureas have been studied and compared with fabrics treated with dimethylolethyleneurea. 1,3-Dimethyl-4,5-dihydroxy-2-imidazolidinone, believed to be a new compound, has been prepared and found to produce wrinkle-resistant cotton fabrics. These fabrics were highly resistant to chlorine damage and had good resistance to acid souring. Wrinkle-resistant fabrics were also produced from 4,5-dihydroxy-2-imidazolidinone. These fabrics, however, were yellowed during curing and were highly susceptible to chlorine damage.

INTRODUCTION

THE textile finisher has at his disposal many crosslinking agents capable of producing wrinkle-resistant finishes for "wash-and-wear" fabrics. One class of widely used agents is based on the methylol derivatives of the cyclic ureas. Although many five- and six-membered ring compounds are included in this group, only some 2-imidazolidinone (ethyleneurea) derivatives are considered in this paper.

The most prominent of the 2-imidazolidinones is dimethylolethyleneurea (DMEU). DMEU (Figure 1) has proven to be an economical as well as an efficient finishing agent. A well-known drawback of the agent, however, is that fabrics finished with DMEU become susceptible to chlorine damage after repeated launderings. Another 2-imidazolidinone agent, dimethyloldihydroxyethyleneurea (Figure 2) has been reported (*1*) to be in use to a considerable extent in Europe, but not to any large extent in this country. Further, it is reported (*1*) that fabrics finished with this agent show a greater susceptibility to chlorine damage than those fabrics finished with DMEU. However, this agent has an advantage in that it has a less adverse effect on lightfastness of dyes than DMEU.

Since there are no free amido hydrogens present in these molecules, the chlorine pickup and fabric damage which does eventually occur in the scorch test after repeated launderings is explained by the formation of free amido hydrogens by one or more of the following mechanisms: a) incomplete reaction and subsequent loss of unreacted methylol groups, b) cleavage of methylene ether linkage formed by reaction of methylol groups, and c) ring cleavage. The formation of free amido hydrogens in DMEU-finished fabric has been widely discussed (*1, 2, 3, 4, 5*) and varying opinions have been given. It is not, however, the purpose of this paper to discuss this problem but rather to describe another finishing agent with a 2-imidazolidinone ring structure which gives a durable finish with improved chlorine resistance.

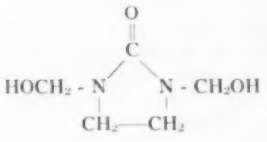


Figure 1
Dimethylolethyleneurea (DMEU)

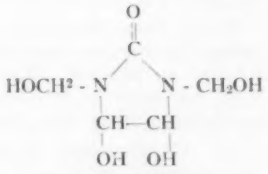


Figure 2
Dimethyloldihydroxyethyleneurea

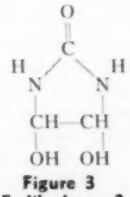


Figure 3
4,5-dihydroxy-2-imidazolidinone

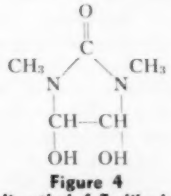


Figure 4
1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone

Dimethyloldihydroxyethyleneurea appears to have four groups capable of reaction with cellulose under the usual conditions for treatment with N-methylol compounds. This agent is prepared from an intermediate, 4,5,-dihydroxy-2-imidazolidinone, and two moles of formaldehyde. The intermediate itself should be a crosslinking agent since the ring hydroxyl groups are chemically similar to N-methylol groups. However, the two amido hydrogens (Figure 3) would make fabric treated with this intermediate susceptible to chlorine damage. Blocking these amido groups with methyl groups to form 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone should produce a fabric much less susceptible to chlorine damage. Chlorine retention, however, could occur if the ring was cleaved. If the ring shown in Figure 4 is stable, fabric finished with this agent should be highly resistant to chlorine damage.

For materials used in commerce, the nomenclature used in this paper will generally conform to the commercial practice rather than to strict chemical nomenclature.

*Presented in part at the New England Regional Meeting, May 5-6, 1961, South Egremont, Mass.

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U S Department of Agriculture.

TABLE I

Properties of fabrics treated with 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone[1]

Treating solution				Properties before laundering				Properties after five AATCC washes		Properties after 10 home washes	
No.	Conc of agent (%)	Catalyst[2]	Approx add-on (%)	Crease-recovery angles W+F (deg)	Nitrogen (%)	Tearing strength W (gms)	Breaking strength W (lbs)	Crease-recovery angles W+F (deg)	Nitrogen (%)	Crease-recovery angles W+F (deg)	Nitrogen (%)
1	10	a	5.0	260	0.87	680	40	234	0.78	231	0.85
2	10	b	2.9	246	0.45	700	39	246	0.37	216	0.36
3	10	c	4.1	270	0.80	460	29	279	0.80	256	0.76
4	10	d	4.9	271	—	510	34	269	—	238	—
5	7.6	c	3.2	264	—	500	33	—	—	—	—
6	7.6	d	3.1	260	—	540	36	—	—	240	—
7	untreated fabric			181	0.03	1067	49	—	—	—	—

[1] All fabrics were cured at 160° C for three minutes.
[2] Catalysts concentration is expressed as percent of padding solution:
a) 0.5% $Zn(NO_3)_2 \cdot 6H_2O$ + 0.05% acetic acid
b) 4% $MgCl_2 \cdot 6H_2O$
c) 1.25% $Zn(BF_4)_2$
d) 0.75% $Zn(BF_4)_2$

EXPERIMENTAL PROCEDURES

I. PREPARATION OF AGENTS——

A) DMEU was prepared by the addition of two molar equivalents of formaldehyde, as 37% formalin, to ethyleneurea to give a 50% aqueous solution, which was adjusted to pH 8 with dilute sodium hydroxide. The solution was allowed to stand overnight before use.

B) 4,5-Dihydroxy-2-imidazolidinone was prepared using a procedure from the literature (*6*), by stirring a neutral or slightly alkaline solution of glyoxal and urea for eight to 16 hours. On cooling, the product crystallized from the reaction mixture.

C) 1,3-Dimethyl-4,5-dihydroxy-2-imidazolidinone was prepared by a method similar to the one used to prepare 4,5-dihydroxy-2-imidazolidinone. N,N'-Dimethylurea (132 gms) was added to 193.5 gms of a 30% solution of technical-grade glyoxal, which had been adjusted to pH 8 with 25% sodium hydroxide or solid sodium carbonate. The solution was stirred for four hours before cooling to about 0°C. Generally the product crystallized slowly on standing at this temperature. Crystallization took place more rapidly at a higher pH (up to 9). The product as obtained from the reaction mixture was generally used in this investigation; however, purer materials were obtained by recrystallization from either 2-ethoxyethanol or ethanol. Crystals obtained from ethanol melted at 135-136°C.

Anal Calculated for $C_5H_{10}O_3N_2$: C, 41.09; H, 6.90; N, 19.17; MW, *146*. Found: C, 41.35; H, 6.90; N, 19.16; MW (by osmometer) = *147*.

Another portion of crystals, also obtained from ethanol, melted at 145-6°C. Found: N, 19.16; MW (by osmometer) = *142*.

These two materials appear to be isomers. Infrared spectra and datum from mixed melting point determination support this conclusion. Wrinkle-resistant fabrics with similar properties were obtained from crude mixtures of the isomers or from the purified isomers themselves.

II. FABRIC TREATMENT——After the agents were prepared, they were diluted or dissolved in water. Catalysts were added to the solution immediately prior to padding.

The fabric used in these investigations was an 80 × 80 cotton print cloth, which had been desized, caustic boiled, and bleached. Padding was done with squeeze rolls using two dips and two nips at a roll pressure to give about 80% wet add-on. The wet fabric was pinned on frames at its original dimension, and dried six minutes at 70°C, and cured three minutes at 160°C in ovens with circulating air. After curing, all fabrics were washed with a nonionic detergent in a slightly alkaline solution and tumble dried. Fabrics were air-equilibrated for at least four hours before approximate add-ons were determined.

III. EVALUATION OF FINISHED TEXTILES——Breaking strength of the fabric samples was determined on strips raveled to 80 threads using the procedure described by ASTM (*7a*), wrinkle resistance by the Monsanto crease recovery method (*7b*), and tearing strength by the Elmendorf method (*7c*). Resistance to chlorine damage was determined by the AATCC "scorch test" procedure (*8*).

The home launderings were performed in a home-type, automatic washer using conditions recommended for cotton fabrics (130-140°F with a 15-minute wash cycle), not the less severe conditions recommended for some "wash-and-wear" fabrics. The wash water for the wash cycle contained hypochlorite to give 0.02% available chlorine and a normal amount of a commercial detergent. Between washings the fabrics were dried in a tumble drier at medium heat.

The treated fabrics were also subjected to five severe launderings as described in AATCC test 91-1958, test IV (*9*). These launderings have been used prior to the chlorine scorch test to determine if a particular finish will be durable to conditions which may be encountered during service.

The resistance of the finished fabrics to acid souring or hydrolytic removal was determined by exposing the fabrics to solutions of a range of acidic pHs for 30 minutes at 40°C. The crease-recovery angles of the resulting fabrics were then determined and compared.

RESULTS AND DISCUSSION

The compound, 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone, and therefore its use as a finishing agent, was not found in the literature. The diureine has been reported (*10*) and was apparently obtained without the isolation of the monoureine, 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone.

Because of this lack of information, the agent was studied with various catalyst systems under identical drying and curing conditions. These results are shown in Table I. All three catalyst systems produced a reaction, thereby establishing the reactivity of the ring hydroxyls. Zinc fluoborate produced a more durable wrinkle-resistant fabric, but the strength loss appears a little higher than that obtained with zinc nitrate or

TABLE II
Properties of fabrics treated with DMEU and 4,5-dihydroxy-2-imidazolidinone[1]

	Treating solution			Fabric properties before laundering			Crease-recovery after laundering	
No.	Agent	Conc of agent (%)	Approx add-on (%)	Crease-recovery W+F (deg)	Tearing strength W (gms)	Breaking strength W (lbs)	After five AATCC washes (deg)	After 10 home washes (deg)
8	DMEU	7	2.7	299	533	28	286	276
9	DMEU	8	3.4	301	547	28	295	—
10	[2]	10	3.6	290	527	30	—	—

[1] Catalyst 0.5% $Zn(NO_3)_2 \cdot 6H_2O$ + 0.05% acetic acid. All fabrics cured at 160° C for three minutes.
[2] 4,5-Dihydroxy-2-imidazolidinone.

TABLE III
Scorch test results on treated fabrics

				Strength retention		
No.	Agent	Conc of agent (%)	Catalyst[1]	Before washes (% of original)	After five AATCC washes (% of original)	After 10 home washes (% of original)
3	[2]	10	c	100	96	96
4	[2]	10	d	100	95	100
5	[2]	7.6	c	96	99	—
6		7.6	d	100	93	96
7	untreated fabric			95	—	—
8	DMEU	7	a	91	69	91
9	DMEU	8	a	94	83	—
10	[3]	10	a	21	—	—

[1] Catalysts concentration is expressed as percent of padding solution:
a) 0.5% $Zn(NO_3)_2 \cdot 6H_2O$ + 0.05% acetic acid.
b) 4% $MgCl_2 \cdot 6H_2O$
c) 1.25% $Zn(BF_4)_2$
d) 0.75% $Zn(BF_4)_2$
[2] 1,3-Dimethyl-4,5-dihydroxy-2-imidazolidinone
[3] 4,5-Dihydroxy-2-imidazolidinone

magnesium chloride. When compared with the DMEU and 4,5-dihydroxy-2-imidazolidinone finished fabrics (Table II) the 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone does not appear to be as effective a finishing agent.

The fabrics finished with 4,5-dihydroxy-2-imidazolidinone become quite yellow during curing or during the afterwash. The fabrics treated with the other agents were not discolored.

As mentioned previously, one of the main objections to DMEU is that the original high resistance to chlorine damage is destroyed by the AATCC washes (9). Therefore, the treated fabrics after being subjected to the AATCC washes and the home washes (Table III) were tested for resistance to chlorine damage. Those fabrics finished with 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone proved to be superior to the DMEU fabrics after the AATCC washes. Thus, it appears that the DMEU finish is cleaved to produce incompletely substituted amido or amino groups with resulting chlorine damage. The 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone apparently is not cleaved in a manner to produce such groups. The data in Table I indicate that little or no nitrogen is lost from fabrics finished with this agent during the AATCC washes, particularly when zinc fluoborate was used as the catalyst. Therefore, one could speculate that the imidazolidinone ring is resistant to rupture and that agents based on the 4,5-dihydroxy-2-imidazolidinones and similar ring structures have a distinct advantage in this respect over DMEU, which can produce incompletely substituted amido or amino groups through the mechanisms discussed in the "Introduction."

As would be expected from the presence of amido hydrogens, the 4,5-dihydroxy-2-imidazolidinone-finished fabric suffered heavy chlorine damage even though it was not subjected to test washes.

The home washes produced some surprising results. Although none of the 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone-finished fabrics showed any damage in the scorch test after the ten washes, the crease-recovery angles decreased sharply in some cases. Again, the data in Table I indicate that little or no nitrogen was lost from the fabrics. Partial cleavage of the cellulose crosslinks is a possible explanation, but rupture of the ring is not likely. Those fabrics cured in the presence of zinc fluoborate retained more of the wrinkle-resistance properties through these washes. Yellowing of treated fabrics during the home washes (with hypochlorite bleach) was not encountered.

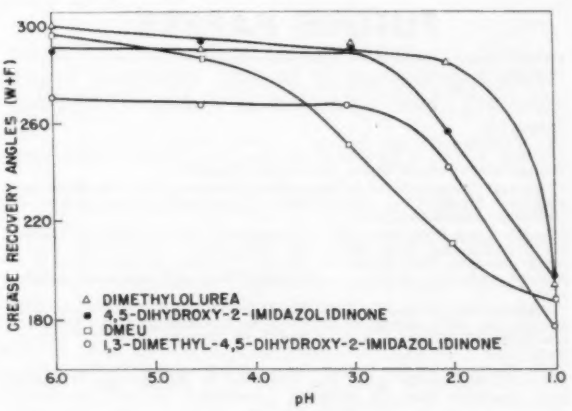


Figure 5
Loss of wrinkle resistance of treated fabric on hydrolysis with solutions of various pH for 30 minutes at 40°C

The resistance of the three finishes to acid souring or hydrolytic removal are shown in Figure 5. A fabric treated with dimethylolurea, which gives a relatively acid-resistant finish, is included for comparison purposes. As expected, the DMEU is removed before the urea-formaldehyde. However, both the 4,5-dihydroxy-2-imidazolidinones are not affected until the pH approaches a value only slightly higher than that required

to remove the urea-formaldehyde. Thus, from the standpoints of durability of chlorine resistance and resistance to acid scouring, 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone appears superior to DMEU.

For the chemist, the problem still remains one of combining the good properties of the DMEU finish and the 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone finish to produce the desired properties. Possibly this might be accomplished by blends of finishing agents, better catalyst systems, or the synthesis and application of other cyclic compounds containing active hydroxyl groups. If this ring is resistant to hydrolysis, the advantages of 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone are likely to be retained.

SUMMARY

1,3-Dimethyl-4,5-dihydroxy-2-imidazolidinone, believed to be a new compound, has been prepared, isolated, and found by reaction of its active hydroxyl groups to produce wrinkle-resistant cotton fabrics. The fabrics so finished have been tested and found to be superior to dimethylolethyleneurea-treated fabrics in resistance to chlorine damage and resistance of the finish to removal by acid. However, fabrics treated with dimethylolethyleneurea have higher crease recovery angles originally and retain this difference through repeated launderings.

4,5-Dihydroxy-2-imidazolidinone-treated fabrics produced high crease-recovery angles. However, the fabric yellowed on curing and the finished fabric was highly susceptible to chlorine damage because of the incompletely substituted amido groups in the agent. This agent does not appear promising, whereas the 1,3-dimethyl-4,5-dihydroxy-2-imidazolidinone does appear promising, and it is indicated that improved agents based on similar ring compounds containing active hydroxyl groups could be developed.

ACKNOWLEDGMENT

The authors wish to acknowledge the aid of Alva F Cucullu for nitrogen determinations; Gloria Gautreaux, Julia M Sloan, Rose M Carriere, and Frank W Snowden for determinations of fabric properties, and George I Pittman for drawing the figure.

LITERATURE CITED

(1) Nuessle, A C, *Textile Inds* 123, No. 10, 116 (Oct 1959).
(2) Mosher, H H, *Textile Research J* 29, 88 (1959).
(3) Frick Jr, J G, Kottes, B A, and Reid J D, *ibid* 29, 314 (1959).
(4) Wannow, H A, *Melliand* 41, 144 (1960). (In English).
(5) Mehta, P C, and Mody, J R, *Textile Research J* 30, 532 (1960).
(6) Badische Anilin- & Soda Fabrik, British Patent 717,287 (Oct 27, 1954).
(7) ASTM Designation a) D39-59; b) D1295-53T; c) D1424-59, American Society for Testing Materials, Philadelphia.
(8) AATCC Tentative Test Method 92-1958, *Tech Manual AATCC* 35, 130 (1959).
(9) AATCC Tentative Test Method 91-1958, Test IV, *ibid* 35, 133 (1959).
(10) Franchimont, A P N, and Klobbie, E A, *Rec trav chim* 7, 236 (1888).

FUTURE PAPERS

Following is a list of specially contributed papers which will appear in future issues of *American Dyestuff Reporter:*

"Critical Survey of Detergent Literature"———Kurt A Schoenberg, Danish Government Home Economics Council

"Effect of Yarn Twist and Fabric Cover Factor on Crease Recovery and Tear Strength"———P C Mehta, Ahmedabad Textile Industry's Research Association

"Formic Acid Colloid of Methylolmelamine Resin Finish of Cotton for Wrinkle-and Muss-Resistance: Preliminary Cost Study"——— K M Decossas, O J McMillan Jr, W N Berard, W A Reeves, E F Pollard and E L Patton———Southern Regional Research Laboratory

"Wrinkle- and Muss-Resistant Finish for Cotton Using Formic Acid Colloid of Methylolmelamine"———W Norbert Berard, Ethel K Leonard and Wilson A Reeves, Southern Regional Research Laboratory

"New Methods for the Preparation of Alkali-soluble Textile Materials"———Robert M Reinhardt, Terrence W Fenner and J David Reid, Southern Regional Research Laboratory

"Continuous Dyeing of Orlon Acrylic Tow"———R J Thomas, E I duPont de Nemours & Co, Inc

"The Influence of a Surface Finish on the Flex Abrasion Resistance of Cotton Sateen"———Clarence J Pope and Louis I Weiner, U S Army Quartermaster R&E Command

"Preparation and Properties of Fibrous Partial Isobutyrates of Cellulose"———Hubert St Mard, Carl Hamalainen and Albert S Cooper Jr, Southern Regional Research Laboratory

"Use of Modern Home Laundry Equipment. II. Cleaning and Wrinkling Effects of Low-temperature Wash Solutions on Naturally Soiled Blouses"———Nada D Poole, Enid S Ross, and R Katherine Taube, Clothing and Housing Research Div, ARS, USDA

"The Effect of the Unsaturated Group on the Weathering of Chemically Modified Cottons"———Ricardo H Wade, Carl Hamalainen and Albert S Cooper Jr, Southern Regional Research Laboratory

"Papin and His New Digester———Inventions of the Pressure Kier and Pressure Dyeing"———Sidney M Edelstein, Dexter Chemical Corp

"Evaluation of Variables in the Pressure Kier Bleaching of Cotton" ———J J Gaido, and H D Terhune, Electrochemicals Dept, E I duPont de Nemours & Co, Inc

"Control of Formaldehyde Release from Fabric Finished with Dimethylol Ethyleneurea"———J David Reid, Robert M Reinhardt, Terrence W Fenner, and James A Harris, Southern Regional Research Laboratory

"The Causes of Tailing in the Pad-Batch Dyeing Process"———Miro Capponi, Sandoz AG

"The Relationship between the Dyeing Conditions and the Practical Saturation Values of Disperse Dyes on Polyester Fibers"——— J Carbonell, Sandoz Ltd

"Improvement of Lightfastness of Dyeings on Synthetic Fibers by Ultraviolet Absorbers—Part I"——— A F Strobel, Antara Chemicals

"How Laminating Techniques Affect Corrosion Resistance of Reinforced-Plastic Equipment for Textile Chemical Operations"——— S S Feuer and A F Torres, Atlas Powder Co

GENERAL CALENDAR OF COMING EVENTS

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, TEXTILE ENGINEERING DIVISION
Nov 1-2 (Annual Meeting———Massachusetts Institute of Technology, Cambridge, Mass); Apr 11-13 (Spring Meeting———North Carolina State College, Raleigh, NC)

CHICAGO SECTION, AMERICAN CHEMICAL SOCIETY
Sept 5-8 (11th National Chemical Exposition———Chicago Amphitheatre, Chicago, Ill)

FIBER SOCIETY
April 11-13 (North Carolina State College, Raleigh, NC)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
Sept 1962 (3rd Exposition, Hannover, Germany)

NARROW FABRICS INSTITUTE, INC
Nov 13-15 (Statler-Hilton, New York, NY)

NATIONAL COTTON COUNCIL OF AMERICA
Nov 8-9 (1961 Chemical Finishing Conference———Sheraton Park Hotel, Washington, DC); Oct 3-4, 1962 (1962 Chemical Finishing Conference———Sheraton Park Hotel, Washington, DC)

NATIONAL RETAIL MERCHANTS ASSOCIATION
May 20-23 (Fibers, Fabrics and Finishes Exposition———New York Trade Show Bldg, New York, NY)

SCHWEIZERISCHER VEREIN DER CHEMIKER-COLORISTEN
October 12-14 (Symposium on "Permanent Finishing 1961"——— Swiss Federal Institute of Technology, Zurich, Switzerland)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Sept 12, Oct 10, Nov 14 (Luncheon Meetings———Palm Terrace Suite, Hotel Roosevelt, New York, NY); Dec 7 (Annual Meeting and Dinner———Hotel Roosevelt, New York, NY)

UNION OF PURE AND APPLIED CHEMISTRY
July 27-Aug 1 (International Symposium on Macromolecular Chemistry, Queen Elizabeth Hotel, Montreal, Canada)
August 6-12 (18th International Congress of Pure and Applied Chemistry———Montreal, Canada)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)

HOW TO GET THE MOST OUT OF YOUR WATER-SOFTENING SYSTEM

R E HINICH
Application Engineer
Water Conditioning Products Section
Allis-Chalmers Mfg Co
Milwaukee, Wis

SIMPLE quality filtration and sodium or hydrogen zeolite water-softening systems serving small- and medium-size moderate-pressure plants, properly installed and maintained, can be expected to give years of trouble-free service.

Where unsatisfactory pressure-filter performance occurs, it is often due to a lack of adherence to recommended operating procedures. To compensate for this oversight, steps can be taken which should readily restore the system to its original efficiency.

At first sign of increasing turbidity in the effluent, a check should be made to determine whether the equipment is still being operated at flow rates within the design capacity. For simple pressure systems using either an anthracite filtering medium or sand and graded gravel, a flow rate of under three gallons per square foot of cross-sectional area per minute is the maximum permissible for satisfactory results. Higher flow rates indicate a need for additional filtration units.

Where plant water requirements have not outgrown filter capacity, a check should be made for possible channeling or fouling of the filter bed. Channeling short circuits water being filtered. It is suspect, if, after vigorous backwashing, the surface of the filter media is not level upon the units being drained. In the event of channeling, the filter bed should be removed, regraded and reinstalled.

Any fouled filter media on the top of a drained filter bed should be carefully removed and discarded to a depth where foreign materials are no longer present. Fresh filter media should then be added to restore the bed to its proper operating level. The depth of fouling may range from four to six inches.

Improper backwashing often results in faulty filtration. Excessive time between backwashes may promote channeling while infrequent backwashing may also cause foreign material to penetrate so deeply into the filter bed that it can no longer be removed by backwashing.

Proper backwashing requires use of sufficient water. In general, filters should be backwashed with as high a flow rate of water as the system can stand without loss of filter media. Backwash water flow should be increased slowly until the full permissible rate is reached. Rapid opening of backwash valves can cause internal upheaval of the filter media, ultimately resulting in "blown beds," a condition tantamount to letting air enter the backwash system. By carefully controlling the rate of flow of backwash water, the filter bed can be properly cleaned without loss of media or upsetting the bed itself. Backwashing should always be continued until the filter is thoroughly cleansed.

A sight glass in the backwash effluent line provides an excellent means of examining backwash results.

The lower distributor or collector system of the filter should be in good condition. If an investigation of poor filter performance shows no upset in the bed itself, it is likely that the lower system is faulty. Broken laterals or clogged areas in the collector system usually promote channeling or mounding of the filter bed. Corrective measures in this case would require repair of the underdrain system.

The addition of surface or subsurface washers to filters that tend to become badly fouled with iron, organic debris, or algae and microbiological growths will often improve their performance. Such washers assist in loosening the fouling materials so they can be satisfactorily removed on each backwash.

Where alum or other coagulants are being fed to the filter system, their feeding devices should be carefully checked at frequent intervals. An annual physical check of the condition of the filter bed will keep the system from becoming so seriously fouled as to require major work.

Problems associated with the performance of zeolite softening systems usually involve either a drop-off in the quality of water obtained or an apparent decrease in the quantity of good water available between regenerations.

Poor-quality water can be caused by channeling or faulty regeneration techniques. Backwash practices to overcome channeling in pressure filters apply equally well for zeolite softeners. In addition, because of the much lighter density material, water temperature plays a far more important part in backwashing zeolite softeners than filters. Backwash rates must be modified as water temperatures change to compensate for the altered lifting ability of water at various temperatures. The bed expansion characteristics of a modern resin at different backwash water temperatures is shown in Figure 1.

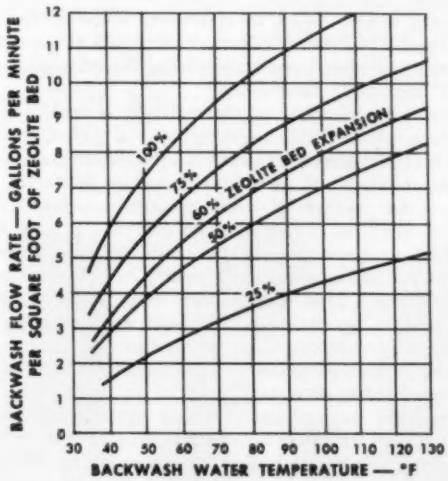
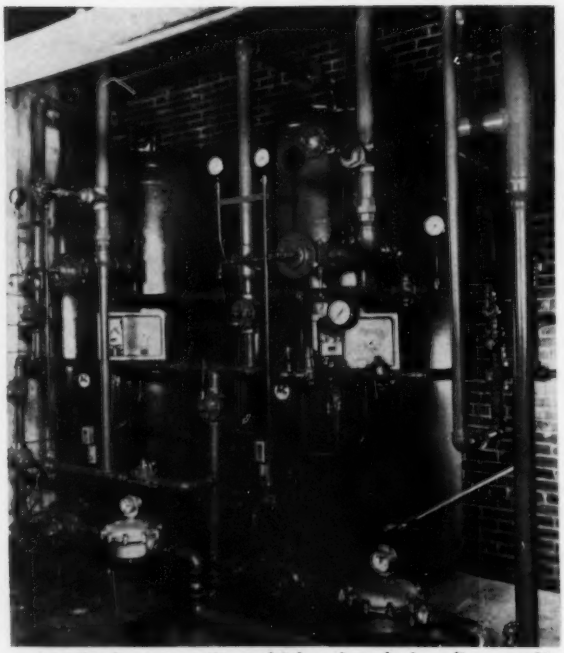
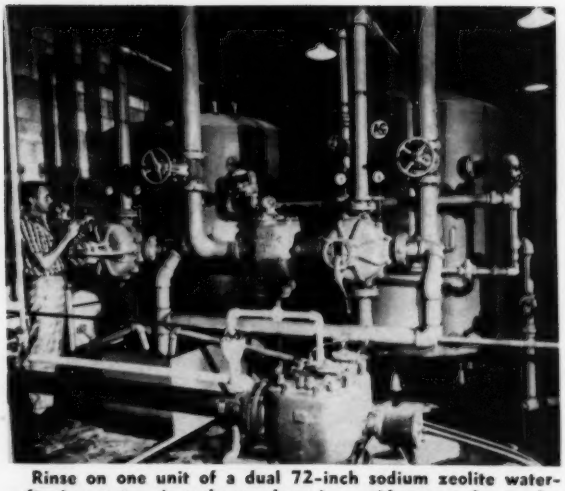


Figure 1



Completely automatic multiple-valve dual sodium zeolite softeners such as these permit installation of units with lower capacity resulting in a reduction in equipment costs and require no operator during regeneration.



Rinse on one unit of a dual 72-inch sodium zeolite water-softening system is underway here in a midwestern dye works. Supplementary treatment and chemical feeding are part of this system. Dual units are recommended when hard water cannot be bypassed and the system must operate continuously. Note thermometer installed in water supply line for use in determining backwash flow rate.

A backwash rate adequate with 60°F water will not provide sufficient bed lifting and scouring at 80°F, while the same flow rate at 40°F would probably lift the bed so high as to backwash zeolite material into the sewer. In effect, improper backwashing will prevent satisfactory loosening of the bed to permit close contact of zeolite particles with regenerant. Channeling, if present, causes insufficient contact between the raw water and the ion-exchange resin, preventing complete exchange.

Both filter and ion-exchange systems should be equipped with some type of backwash flow rate regulating device. Where multiport valves are used, an adjustable orifice in the valve is frequently employed. Otherwise, a throttling valve in the backwash inlet or outlet header should be used to properly set or adjust the backwash flow rate. A manometer or other rate indicating device and a thermometer fitted in the backwash supply line are sometimes furnished by equipment suppliers and are extremely useful in establishing required backwash flow rates.

There are a number of reasons why a zeolite system may drop off in total capacity over a period of time. These include increased raw water hardness, starvation or deterioration of the ion-exchange material, and faulty water meters or leaky multiport valves.

Where there is evidence of an increase in raw water hardness, a check should be made to determine the effect of the increase on the capacity in gallons between regenerations. This calculation may show that the equipment is operating at as high an exchange rate as originally contemplated and that an increase in hardness of the raw water is responsible for the lowered capacity of softened water.

On sodium or hydrogen zeolite systems, starvation can be caused by using an insufficient quantity of brine or dilute acid. A salt bed of 12 inches or more is recommended to produce a saturated brine. Starvation may also result from using too much dilution water with the concentrated regenerant.

The newer ion-exchange resins for application in either sodium or hydrogen zeolite softening systems are capable of performing over wide ranges of temperature, pH and other influent water characteristics.

Older greensands or synthetic resins are more susceptible to high temperatures, high or low pH, intermittent chlorine residuals of more than one part per million, low raw water silica content, and increased flow rates than are the newer ones.

While the initial cost of older ion-exchange materials may be less, their lower exchange efficiency requires higher regenerant dosages than the newer high-capacity resins. This means higher operating cost, more wear and tear on equipment, more operator's time, and more frequent exposure of parts to corrosive brine solution.

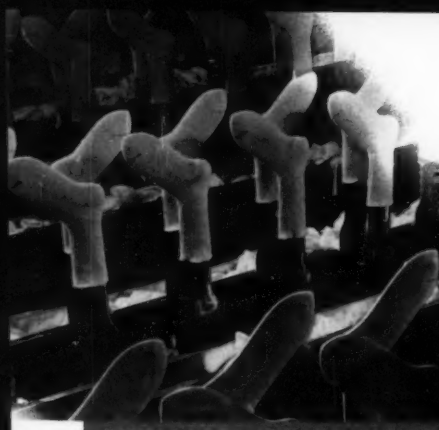
Rinsing of the free calcium, magnesium and sodium ions from the resin bed must be done before the exchange material will again remove hardness. To rapidly displace larger volumes of spent brine, a fast rinse after brining and slow rinsing is desirable for softeners 20 inches in diameter and larger. Systems which have no provision for a fast rinse require a long period of slow rinse to get the unit back on the line.

Fouled ion-exchange beds can be easily and inexpensively cleansed with resin cleaning materials properly applied.

Water meters used as a measure of flow rate or quantities of water softened between regeneration should be tested for accuracy every few years.

Should multiport valves leak across the face or seat of the internal parts to cause intermingling of raw water with the effluent, the leakage can be readily detected by sampling ahead of the valve to get a true test of the performance of the exchange material. To assure satisfactory performance, faulty valves should be repaired.

In general, adherence to these simple procedures will assure efficient and satisfactory operation of the filtration or water-softening systems for small- and medium-size moderate-pressure plants.



BECCO ECHO

PUBLISHED BY BECCO CHEMICAL DIVISION Food Machinery and Chemical Corporation, New York 17, N.Y.

Best Foot Forward

Socks are worn in all sizes, shapes, colors and lengths. Sometimes they are even worn inside out, but no matter which way, you want to put your best foot forward.

The Adler Hosiery Company, a division of Burlington Mills in Cincinnati, relies on Becco's Hydrogen Peroxide to assure that they always have *their* best foot forward in the production of wool socks. You, the customer, can expect the finest in workmanship, thanks to this combination of Adler's excellent production methods and Becco's experience in the techniques of bleaching.

Adler enjoys the reputation of producing superior white wool athletic socks that are worn in high schools and colleges, and on athletic fields throughout the country, as well as bright stockings of varied colors. Becco's Hydrogen Peroxide is used in the bleaching department, one of the major areas of the Adler plant.

Becco's 35% Hydrogen Peroxide is used in a bleach developed for Adler quite a few years ago. Used with tetrasodium pyrophosphate, the peroxide provides active bleaching and detergency. What's more, inspection under Adler's strict quality-control program proves that this Becco bleaching technique has protected the wool to the fullest.

The dye room too, depends on Becco's Hydrogen Peroxide, but as a cleansing agent rather than a bleach. The peroxide thoroughly removes all traces of previously-used dyes from the stainless steel equipment, eliminates contaminants, and assures bright, pure colors from the fresh dyes.

And that is only part of the Becco story. Becco has cooperated fully with Adler, and with other companies, in developing a tank storage and pressure distribution system for its Hydrogen Peroxide. This system saves considerable money, since it eliminates waste and handling of small containers. Adler has been pleased with Becco's technical service, and we know you will be, too. Write or call and let's see if we can help you. Address: Dept. ADR-61-8.

BECCO ECHO

No Fish Story Here!

MEN are natural exaggerators when they describe the results of their fishing trips. Let them catch a minnow, and they bring home a whale! Becco, on the other hand, bends over backwards to assure *accuracy* in the delivery of specified quantities of hydrogen peroxide to its customers.

Thoroughly cleaned and carefully inspected aluminum drums are placed singly on Howe or Toledo scales; the reading is set at zero. The drums are filled with filtered hydrogen peroxide until the scale shows the labelled shipping weight. Carboys are handled similarly. These scales are inspected monthly by representatives of the scale company to maintain accuracy.

At our Buffalo plant, a Howe Track Scale and Type Registering Weighbeam is used for weighing tank cars and tank trucks. In the case of a tank car, the vehicle is placed on the scale, weighed, and a record is made of the tare weight. Filtered hydrogen peroxide is pumped into the car until it is filled to the base of the dome. It is then inspected, since the load, if not filled to the exact height, can cause the car to oscillate dangerously when it is in motion. The car is sealed and weighed. The difference between the two readings is the weight of hydrogen peroxide in the tank car. Finally, Becco's accounting department and the railroad receive copies of the printed records. The scales used are inspected and tested four times a year, and no inaccuracies have ever been reported.

The weighing of tank trucks is handled with similar care to ensure accurate delivery, and a weight certificate is furnished to each customer.

So, the fishermen have their stories, and we have ours—and ne'er the twain shall meet!

MORE than a third of a century of experience shows! Ever since it was founded 36 years ago, Becco has devoted its time and energy to the manufacture of hydrogen peroxide and to research in its application. Today, Becco provides industry with 10 additional peroxygen chemicals based on electrolytically-produced hydrogen peroxide.

Becco serves many industries—textile, paper, plasticizers, cosmetics, metal finishing, and is even doing its share in the fields of missile guidance and propulsion. The broadened use of peroxygen chemicals owes much of its present state to Becco's Research and Development staff which continuously studies customers' needs in an effort to keep pace with today's—and tomorrow's—world.

The technical "know-how" of our chemists, engineers, and technical fieldmen is available to you. Their experience has been condensed in a series of technical bulletins. A few are listed at right. If you find any of interest, just drop us a line on your letterhead and ask for the ones you want by number. We'll be happy to oblige.

AVAILABLE TECHNICAL BULLETINS

Product Descriptions

1. ACTIVE OXYGEN CHEMICALS
2. HYDROGEN PEROXIDE
3. HIGHLY CONCENTRATED H_2O_2
4. PERACETIC ACID 40%
6. SODIUM CARBONATE PEROXIDE
7. ALKALINE EARTH METAL PEROXIDES
8. SODIUM PYROPHOSPHATE PEROXIDE
10. UREA PEROXIDE
11. POTASSIUM PERSULFATE
41. BECCO H_2O_2 35% HP
42. BECCO H_2O_2 35% FORMULA D
45. SODIUM PERBORATE
46. CONCENTRATED H_2O_2
49. AMMONIUM PERSULFATE
70. BECCO HYDROGEN PEROXIDE 98%

Properties, Reactions, etc.

24. ANALYSIS OF ALIPHATIC PERACIDS
34. USES OF PERSULFATES A BIBLIOGRAPHY—PART I
40. EQUIPMENT FOR USE WITH HIGH-STRENGTH HYDROGEN PEROXIDE
55. STABILITY OF PURE HYDROGEN PEROXIDE
59. THE ANALYSIS OF H_2O_2 SOLUTIONS
62. HYDROGEN PEROXIDE VAPOR
68. USES OF PERSULFATES A BIBLIOGRAPHY—PART II
87. THE BEHAVIOR OF THE GLASS ELECTRODE IN HYDROGEN PEROXIDE SOLUTIONS
93. ANHYDROUS HYDROGEN PEROXIDE AS A PROPELLANT

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION ®

BECCO Hydrogen Peroxide

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Becco Chemical Division

General Sales Offices:
161 EAST 42nd STREET, NEW YORK 17, N. Y.

PROCEEDINGS

American Association of Textile Chemists and Colorists

Copyright, 1961, American Association of Textile Chemists and Colorists

July 24, 1961 No. 15

FOUNDER

LOUIS A OLNEY
(deceased)

COUNCIL OF THE ASSOCIATION

PRESIDENT ELLIOTT MORRILL, Corn Products Co, 1437 West Morris St, Indianapolis, 6, Ind

VICE PRESIDENTS (*New England Region*): W GEORGE PARKS, University of Rhode Island, Kingston, RI; (*Central Atlantic Region*): W S SOLLENBERGER, American Viscose Corp, Marcus Hook, Pa; (*Southern Region*): A HENRY GAEDE, Laurel Soap Mfg Co, PO Box 1083, Charlotte 1, NC; (*Western Region*): JOSEPH H JONES, Phoenix Dye Works, 4755 W 150th St, Cleveland 35, O

TREASURER ARTHUR R THOMPSON, 2132 Dilworth Rd E, Charlotte 3, NC

EXECUTIVE SECRETARY GEORGE P PAINE, AATCC National Headquarters, PO Box 28, Lowell, Mass

CHAIRMAN, EXECUTIVE COMMITTEE ON RESEARCH CHARLES A SYLVESTER, E I duPont de Nemours & Co, Inc, Rm 8516, Nemours Bldg, Wilmington 98, Del

PAST PRESIDENTS (Living) ELVIN H KILLHEFFER, P J WOOD, WILLIAM H CADY, CARL Z DRAVES, THOMAS R SMITH, WILLIAM D APPEL, HENRY F HERRMANN, C NORRIS RABOLD, J ROBERT BONNAR, GEO O LINBERG, WELDON G HELMUS

NATIONAL COUNCILORS REPRESENTING SECTIONS (*Northern New England*): J J O'NEIL JR, R D ROBINSON, D H THOMAS; (*Rhode Island*) K J BRODEN, E W LAWRENCE, F H CASEY, R B TAYLORSON; (*Western New England*): T J GILLICK JR, A W GOODWIN; (*Delaware Valley*): W H BERTOLET, 3RD, J E CONWAY, J H DAVIDS, V D LYON, L K McCHESNEY; (*Hudson-Mohawk*): H G GENDREAU, F J SZUREK; (*Metropolitan*): E C HANSEN, W A HOLST, J A KOMNINOS, R E MILLER, C R TROMMER, A R WACHTER, G S WHAM; (*Niagara Frontier*): J E LOUGHLIN; (*Northern Piedmont*): S M CONE JR, C HOOPER, H Y JENNINGS; (*Palmetto*): J C KING, L T KELLY, L C REYNOLDS; (*Piedmont*): F FORTESS, W E RIXON, R E RUPP, L L WYSS; (*South Central*): J D MOSHEIM, J O SWEITZER; (*Southeastern*): J C COOK, R B HALLOWELL, J W RICHARDSON; (*Washington*) N GETCHELL; (*Mid-West*): W O FISCHER, J G KELLEY, A J OLSON; (*Pacific Northwest*): R E NEWMAN; (*Pacific Southwest*): W E KRAMER

TREASURER EMERITUS

WILLIAM R MOORHOUSE
PO Box 352, South Yarmouth, Mass

CHAIRMEN, COMMITTEES OF THE COUNCIL

STANDING COMMITTEES—

Executive Committee of Council	ELLIOTT MORRILL
Executive Committee on Research	CHARLES A SYLVESTER
Technical Committee on Research	GEORGE S WHAM
Publicity	EDWARD ARTIM
Appropriations	THOMAS R SMITH
Membership and Local Sections	W GEORGE PARKS
Publications	PAUL J LUCK
Corporate Membership	W S SOLLENBERGER
Constitution and Bylaws	WILLIAM A HOLST
Conventions	E I STEARNS
Technical Programs	T R FOLTZ JR & J ROWATT
Archives	SIDNEY M EDELSTEIN
Textile Education	LEONARD SMITH
Subject and Speakers' Bureau	MATTHEW J BABEY

SPECIAL COMMITTEES—

Annual Intersectional Technical Paper Competition	THOMAS J GILLICK JR
Employee Pension and Retirement Advisory	ELLIOTT MORRILL
Individual Membership	H A STAUDERMAN
Olney Medal	M HARRIS
Harold C Chapin Award	SIDNEY SPRINGER
American Dyestuff Reporter Award	PAUL B STAM
Student Award	JAMES L TAYLOR
Study Committee on an Endowment Fund	P J WOOD

NATIONAL HEADQUARTERS

PO Box 28, Lowell, Mass
Tel: GLenview 8-8034

Executive Secretary	GEORGE P PAINE
Technical Secretary	GEORGE J MANDIKOS

LOCAL SECTION OFFICERS

New England Region

NORTHERN NEW ENGLAND *Chairman*: EDWARD J McNAMARA JR, Hamilton Chemical Corp, Lowell, Mass; *Secretary*: JOSEPH S PANTO, Fabric Research Labs Inc, 1000 Providence Highway, Dedham, Mass; *Vice Chairman*: FRANK J RIZZO; *Treasurer*: WILLIAM W PENNOCK

RHODE ISLAND *Chairman*: JOHN J ROARKE, Bradford Dyeing Assoc, Bradford, RI; *Secretary*: RICHARD V DUGDALE, Rohm & Haas Co, 1226 Industrial Trust Bldg, Providence 3, RI; *Vice Chairman*: CHARLES A ROBINSON; *Treasurer*: HAROLD B STURTEVANT

WESTERN NEW ENGLAND *Chairman*: ALBERT H RANT, Laurel Soap Mfg Co, 206 Calla St, Providence 6, RI; *Secretary*: WILLIAM H ESPELIN, 7 Hearthwood Drive, Barrington, RI; *Vice Chairman*: TIMOTHY J HORAN; *Treasurer*: BURTON C WINKLER

Central Atlantic Region

DELAWARE VALLEY *Chairman*: CLARENCE A SEIBERT, Scholler Bros, Inc, Collins & Westmoreland Sts, Philadelphia 34, Pa; *Secretary*: ERNST W EMPTING, Verona Dyestuffs, 351 Lancaster Ave, Haverford, Pa; *Vice Chairman*: EDWARD G HAACK; *Treasurer*: CHARLES N KUZMA JR

HUDSON MOHAWK *Chairman*: FLOYD J SZUREK, Mohasco Industries, Inc, Amsterdam, NY; *Secretary*: ARMAND DI MEO, Rebel Dyeing Corp, Johnstown, NY; *Vice Chairman*: ACHILLES S MAFILIOS; *Treasurer*: WALTER DRAUTZ

METROPOLITAN *Chairman*: PERCY J FYNN, J C Penney Co, Inc, 330 W 34th St, New York, NY; *Secretary*: GEORGE A JONIC, American Cyanamid Co, 48 W 38th St, New York 18, NY; *Vice Chairman*: RICHARD P MONSAERT JR; *Treasurer*: EUGENE J GRADY

NIAGARA FRONTIER *Chairman*: ANTON M VIDITZ-WARD, Allied Chemical Corp, Elk St, Buffalo, NY; *Secretary*: DANIEL E BOLAND, Western Electric Co, Inc, Buffalo, NY; *Vice Chairman*: NICHOLAS MOHORUK; *Treasurer*: JOHN NIHILL

Southern Region

NORTHERN PIEDMONT *Secretary pro tem*: JAMES E GREER, Burlington Mills Corp, Greensboro, NC

PALMETTO *Chairman*: RICHARD E RETTEW, Polymer Southern, Box 2184, Greenville, SC; *Secretary*: E THOMAS McILWAIN, Ansbacher-Siegel Div, Sun Chemical Co, Rock Hill, SC; *Vice Chairman*: NEAL A TRUSLOW; *Treasurer*: WILLIAM E BALDWIN

PIEDMONT *Chairman*: VINCENT B WRIGHT JR, North Carolina Finishing Co, PO Box 1100, Salisbury, NC; *Secretary*: E P LAVOIE, Morningstar-Paisley, Inc, PO Box 3622, Charlotte, NC; *Vice Chairman*: V B HOLLAND; *Treasurer*: ROBERT L WARD

SOUTH CENTRAL *Chairman*: RICHARD J TYRRELL, Peerless Textile Div, Burlington Industries, Cleveland, Tenn; *Secretary*: W JACK WELBORN, Riegel Textile Corp, Trion, Ga; *Vice Chairman*: LOWELL SHIVE; *Treasurer*: ARTHUR R WILLIAMS

SOUTHEASTERN *Chairman*: WILLIAM B AMOS, The Jefferson Mills, Inc, Jefferson, Ga; *Secretary*: RICHARD M JONES, Chemical Services, Inc, Box 8007, Station F, Atlanta, Ga; *Vice Chairman*: LEON TIGLER; *Treasurer*: RICHARD D SEED

WASHINGTON *Chairman*: LOUIS R MIZELL, Harris Research Labs Inc, 6220 Kansas Ave, NE, Washington 11, DC; *Secretary*: FLORENCE H FORZIATI, Clothing and Housing Research Div, Agricultural Research Service, Washington 25, DC; *Vice Chairman*: ESTHER BATCHELDER; *Treasurer*: EDMUND BURAS JR

Western Region

MID-WEST *Chairman*: JAMES L McGOWAN, Morgan Dyeing & Bleaching Co, Rochelle, Ill; *Secretary*: ARTHUR J ANDREWS, Keystone Aniline & Chemical Co, 321 North Loomis St, Chicago 7, Ill; *Vice Chairman*: FRANK S STOVER; *Treasurer*: JAMES E MILLER

PACIFIC NORTHWEST *Chairman*: HUBERT N SHEA, Jantzen, Inc, 411 NE 19th Ave, Portland 14, Ore; *Secretary*: JOHN F SHELTON, Great Western Chemical Co, Portland, Ore; *Vice Chairman*: ROBERT WELSH; *Treasurer*: DALE W KIMSEY

PACIFIC SOUTHWEST *Chairman*: ANGUS H ROBERTS Nopco Chemical Co, Hermosa Beach, Calif; *Secretary*: RICHARD C DEMUTH, Dye Masters Inc, 1511 W Florence Ave, Inglewood 3, Calif; *Vice Chairman*: DAVID D SANDERS; *Treasurer*: FREDERICK L WILHELM

STUDENT CHAPTERS

Auburn University, Bradford Durfee College of Technology, Clemson College, Georgia Institute of Technology, Lowell Technological Institute, New Bedford Institute of Technology, North Carolina State College, Philadelphia College of Textiles and Science

Metropolitan Section———

AMERICAN STANDARD PERFORMANCE REQUIREMENTS FOR TEXTILE FABRICS*

EPHRAIM FREEDMAN

Director, Macy's Bureau of Standards

Chairman, Technical Committee, National Retail Merchants Assoc

Chairman, Consumer Goods Standards Board, American Standards Assoc

This presentation includes a brief outline of events leading up to the promulgation of these standards, their scope, the contribution of the AATCC, which through the creation of standard test procedures made these standards possible, the growing impact of these standards on textile manufacturers, distributors, finishers, dyers, retailers and service industries, and the benefits to be derived through adherence to these standards.

An example of how the elements of these standards dealing with laundering and drycleaning can be transmitted, economically, clearly, consisely and factually, from the dyer and finisher through the various channels of trade to the ultimate consumer via Sure Care Symbols, is illustrated.

INTRODUCTION

WITH your indulgence, I will endeavor to provide some of the historical background for the subject being presented to you this evening.

A study of the literature will reveal the sizable contributions to informative labeling intended to disclose the performance of textile fabrics, by Henry Herrmann, Alexis Sommaripa, Earl Edgerton, Jules Labarthe, Arthur Wachter and others.

The picture I am about to portray is tinctured or colored by a more or less personal approach, due to my having been a member of a family devoted to the clothing business. Also, prior to the thirty-three years spent with Macy's, seventeen years were devoted, in great measure, to the evaluation and manufacture of foods, drugs, and cosmetics.

The strength and purity of drugs, the cleanliness and edibility of foods and the factual labeling of both foods and drugs had been subject to Federal Laws and Regulations during those prior years. Also, I was a strong disciple of Harvey W Wiley, the author of the Food and Drug Act of 1906, then Secretary of Agriculture in the Theodore Roosevelt administration. It was natural, therefore, that there would accompany me into the retail field and through it, to this great textile industry in which this Association plays so important a role, an approach, which, in my humble judgment would result in more rapid progress within that industry.

From the outset, it was apparent that this Association had already been devoting much of its time and effort toward the evaluation of laundering methods, of dyestuffs, and of dyed and printed materials in terms of colorfastness to laundering, to lightfastness, to chlorine and to perspiration, as well as to fastness to crocking. Nevertheless there existed a great gap between producer and consumer—a lack of information regarding end-use problems—a lack of understanding of manufacturing and procurement difficulties—a lack of information which would help the consumer buy wisely and consume intelligently, and which, therefore, would lessen consumer dissatisfaction with her purchases and reduce the amount of poor-quality returns.

It was with much appreciation, therefore, that I accepted your kind invitation and addressed you, on March 19, 1928 on the "Examination of Textiles from the Retailer's Point of View" (*1*). The suggestions I offered to you then were

1) "that extensive tests be carried out, covering the various factors" (ie, weakness of material, weighting, dyes, washing, bleeding and crocking) "with the object of *producing standards* for materials coming under the necessity or utility class";
2) "that definitions be formulated which would convey to the purchaser accurate information—eg, fastness of color, washing, resistance to perspiration";
3) "that materials be labeled to indicate their content".

During the question and answer period that followed, your Chairman, Samuel Hayes, stated, and I quote: "and that brings out the same thought I tried to express a while ago, that a laboratory such as this" . . . "would bring about honest competition between different manufacturing establishments; and that is what we all want", unquote. Your president, E H Killheffer, had the following to say, and I quote: "It seems to me that this Association laboratory that we are trying to visualize would be of very great benefit for companies like R H Macy and others in their insistence upon having fabrics of a certain standard of fastness, when these standards are once known, because they could very easily—if this scheme comes to full fruition, as we hope it will—say to the manufacturers from whom they buy 'we want this particular fabric to be of fastness A-3 (or A-4 or B-6, or whatever it might be)' and make him certify that it is of that fastness; and we hope to have an institution that can so certify".

From the preceding comments in 1928, 32 years ago, by the president of this Association and by the chairman of this Section, it should be apparent to all that there was great need for

1) Standard test methods,
2) Standard definitions to interpret the results of tests conducted according to these standard test methods, and
3) A means of communicating the performance of textiles in terms of these standard test methods.

In 1929, I presented to this Section a paper entitled " A Proposed Method for Describing Materials and Garments" (*2*), which, incidentally, resulted in my being the recipient of an Award from the Association.

During the discussion period which followed, our friend of long standing, P J Wood, suggested that the mention of, and I quote: "Methods 1, 2, and 3 rather implies a classification of '1' being superior, '2', somewhat inferior, and '3' quite inferior".

*Presented before the Metropolitan Section November 18, 1960 at Kohler's Swiss Chalet, Rochelle Park, NJ

Acting upon his suggestion, we changed the classifications to

Method B for commercial laundering

Method O for ordinary home laundering, and

Method C for careful washing.

Both of the papers referred to above were presented prior to the panic of 1929 and the great depression that followed. The Research Committee of this Association and Committee D-13 of the American Society for Testing Materials were, nevertheless—and I quote from the record—"laboring to establish recognized methods for test for textiles, capable of permitting the textile industry to come to a better understanding of the performance, durability, and utilitarian value to the ultimate consumer".

The "record" to which I refer is my presentation before this Section in 1932 entitled "The Research Chemist Looks at Consumer Textiles" (3).

In this presentation, I went on to say, and I quote: "the rank and file of the textile industry, however, has failed to take advantage of the valuable information developed for its benefit and is consequently suffering most severely".

Time does not permit of our delving into this "paper" at great length, but those of you who are interested may find in it, perhaps, the first public presentation of minimum specifications for various textile products. These specifications may well be considered the progenitor of American Standard L-22.

In the discussion period which followed, many questions were asked similar to those we hear these days.

Some of the comment dealt with the adequacy of the specifications, others with the economics of dyeing and printing. The one phase of the discussion that is most pertinent to the subject at hand this evening is the subject of "communication". Frederick W Stanton, colorist for the Sussex Print Works of Newton, NJ, wanted to know why salespeople could not tell customers whether fabrics or garments were made of silk or acetate rayon, whether silks were weighted or not, et cetera.

Obviously, here was a textile chemist who realized the importance of "communication". The importance of "communication" was also demonstrated during the long, drawn-out struggle to establish a factual disclosure of residual shrinkage in woven cotton yard goods.

In 1932, this Association reported out a standard method for determining such shrinkage. The same folks who now oppose the implementation of L-22 as a voluntary standard opposed the creation of a voluntary shrinkage standard. It was not until 1938 that the "communication" of factual information became mandatory rather than voluntary when any mention or implication thereof was made. And, I daresay the opponents of the shrinkage standards would—today—rise up in arms, if an attempt were made to dispense with those standards.

As the years rolled on, both this Association and the American Society for Testing Materials worked with steadily increasing effort to widen the scope of their research activities —not for academic reasons—but rather because the manufacturing industries involved could become better acquainted with, and thereby more intimately informed regarding the limitations as well as the attributes of their processes, applications and products. Does any one need a finer example of the real worth of this Association's efforts to finishers, printers and dyers, and in fact to all textile fiber, yarn and fabric producers than its *Technical Manual*?

Can it be denied that the more than 80 different test methods, embracing so wide an approach to the identification, properties and behavior of the raw materials, processes and products use, employed and produced by this industry provide a broad avenue of communication?

Can anyone rightfully refute the claim that the entire textile industry as well as retailers and consumers have benefited immeasurably because of this factual and authoritative avenue of communication?

I haven't even begun to enumerate the many other informative sections of the *Technical Manual*, such as the Tabulation of American Dyes, the Tabulation of American Resin-Bonded Pigments, the list of Textile Chemical Specialties.

Does it require much imagination to visualize the confusion and frustration that the industry would be faced with if this valuable means of communication would suddenly become unavailable?

Only when we realize the scope and the objectives of this important document and the service it is rendering to the entire industry can we begin to understand the legitimate need for an additional avenue of communication between the mill and the converter, between the mill or converter and the finisher and dyer, and vice versa, between the mill or converter and the cutter or retailer, between the cutter and the retailer, and, finally, between the retailer and the consumer.

An avenue of communication can be one that provides for a swift flow of information with a minimum amount of casualties, or shall we say complaints, returns and financial losses, as well as damage to one's reputation. Or, it can be so clogged with traffic, or to rephrase it, so clogged with detailed information, regardless of its accuracy, that the industry just won't use it. Or having developed the information and desiring to send it out, we find that the details bog us down, consume too much of our time, and add too much to our costs to make the effort worthwhile.

This additional avenue of communication, therefore, must be the counterpart of the modern high-speed turnpike, or thruway, if it is to be smooth, even, clear, swift and safe.

Only because of the existence of AATCC and ASTM test methods and nomenclature has such a means of communication been made possible—I refer to American Standard Performance Requirements for Textile Fabrics L-22.

In 1930 the American Viscose Corporation, as a manufacturer of a basic textile fiber, came to realize the need for safeguarding the integrity of its product. It hit upon a "Crown-Tested" plan which at first controlled only the size of garments. It soon realized that colorfastness and shrinkage control were also important, and added these to the minimum requirements for "Crown-Tested" Fabrics. In 1942 Avisco revitalized the "Crown-Tested" Plan on an improved basis incorporating end-use requirements. This plan helped provide an added incentive for the more widespread production of serviceable rayon fabrics by providing a reliable avenue of communication from the converter, to the cutter, to the retailer, and finally to the consumer.

While this plan was discontinued in 1947, the National Retail Dry Goods Association—now known as the National Retail Merchants Association—sponsored the establishment of American Standard Minimum Requirements for Rayon and Acetate Fabrics. This Standard, better known as ASA L-22, contains 24 "American Standard Minimum Requirements for rayon and acetate fabrics employed in the manufacture of Women's and Girls' rayon wearing apparel"; 16 "American Standard Minimum Requirements for rayon and acetate fabrics employed in the

manufacture of Men's and Boys' Rayon Wearing Apparel"; and 11 "American Standard Minimum Requirements for Rayon and Acetate Fabrics" used in the manufacture of rayon home-furnishings. The test methods for evaluating these fabrics were obtained from both official and non-official sources.

These standards performed a useful purpose in serving to eliminate many substandard rayon and acetate fabrics.

While American Viscose Corp was concentrating upon the development of its "Crown-Tested" Program, Macy's embarked on a comprehensive program of developing standards for its own brand products. In answer to the demand of leaders representing consumers, Macy's proceeded to affix to its branded products labels bearing specifications for the products as well as washing or drycleaning instructions. (Figure 1).

While considerable consumer interest developed through the use of these informative labels, this avenue of communication was too technical and too cluttered up with detail. Many consumers did not take the time to read them. Few readers understood the significance of the technical information.

With the advent of World War II, procurement problems militated against the continuance of this type of informative labeling.

With the end of World War II, the availability of textiles increased, insuring more than an ample supply of consumer goods.

The textile industry, however, had undergone meanwhile a considerable change. Carpet wools from China were becoming scarce. Nylon had caused most of the silk to disappear from the market place. Aralac, Orlon, Dynel were among the newer fibers to put in an appearance. New textile finishes were encountered. Each new fiber and each new finish was accompanied by claims of performance which frequently found cutter, retailer and consumer thoroughly confused and ofttimes frustrated.

Some folks were of a mind that mandatory disclosure of fiber content would solve the problem. The demand for such disclosure snowballed, until the Textile Fiber Products Identification Act became a reality. Seventeen different classifications were esablished for man-made fibers hitherto promoted through hundreds of registered trade-names. Combinations of one or more of these man-made fibers with each other or with natural

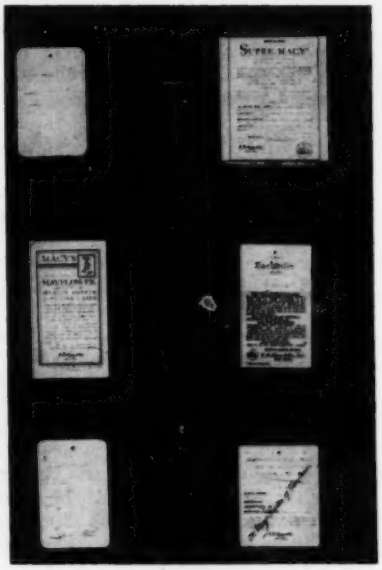


Figure 1

fibers were becoming commonplace.

The claims for these fibers, plus claims for washability, wearability, wrinkle resistance, crease retention, "wash-and-wear", no-pilling, durable water-repellency, no-spotting, no weight, et cetera—found their way to consumers via as many as seven different tags or labels affixed to a single product.

The urge to decorate textiles with labels grew to such an extent that some folks divorced themselves from the textile field and entered the more profitable business of making labels. Not only was the consumer and the retailer befogged by all of these labels —the cutter was equally bewildered —besides which the cost of all of these labels added to his cost of doing business.

Thus, in fact, we, the retailers as well as our customers, found ourselves going absolutely no place at all, on this multilabel avenue of communication.

Sensing that such a situation would eventually evolve, the National Retail Merchants Association requested that L-22 be expanded to cover the major end-uses of all fabrics irrespective of fiber content.

On May 21, 1956 the Consumer Goods Standard Board of the ASA approved this expansion to cover the end-use of fabrics, regardless of fiber content, for men's wear, women's wear, and home furnishings and to include the development of procedures for labeling, tagging and other effective methods to promote the use of standards developed under this project.

Meanwhile, the Textile Distributors Institute had developed proposed standards for end-use similar to those undertaken by L-22. On March 1, 1956, TDI made available to ASA its proposals for coordinating the proposed standards with L-22, thus eliminating development of parallel standards which would create endless confusion and misunderstanding throughout the industry.

The Technical Committee, under the able leadership of Cameron Baker, in addition to working as a committee of the whole, set up special subcommittees for developing standards for such end-use articles as rainwear, nylon and polyester warp knit fabrics, and for acetate and triacetate knitted fabrics. The drafts of the proposed standards were widely circulated among the ready-to-wear industry, as well as among all other agencies and individuals showing interest in the development of the standards.

On February 11, 1960, L-22 was approved as an American Standard.

The textile organizations and associations which served on the sectional committee L-22 at the time of approval included

The Corset and Brassiere Association of America

National Association of Shirt, Pajama and Sportswear Manufacturers

New York Raincoat Manufacturers Association

Synthetic Yarn Producers (by company representation)

Textile Distributors Institute, Inc

Upholstery and Decorative Fabrics Association of America

Warp Knit Fabric Manufacturers Group of the American Cotton Manufacturers Institute, Inc.

The Textile Fabric Association was represented by observers.

Retailers were represented by

American Retail Federation

Association of Buying Offices

Mail Order Association of America

National Association of Retail Clothiers and Furnishers

National Retail Merchants Association

Variety Stores Association, Inc.

Printers and dyers were represented by

Silk and Rayon Printers and Dyers' Association of America, Inc.

Services Industries were represented by

The American Institute of Laundering

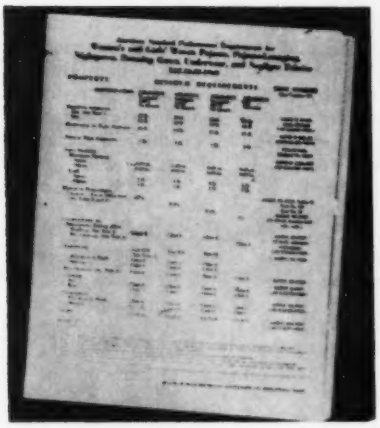


Figure 2

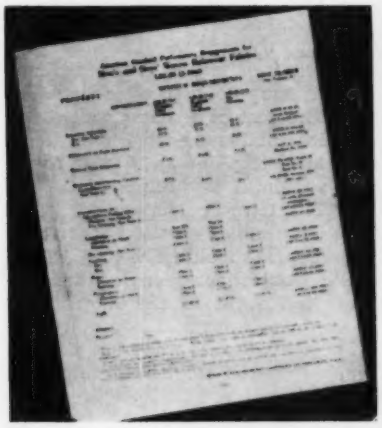


Figure 4

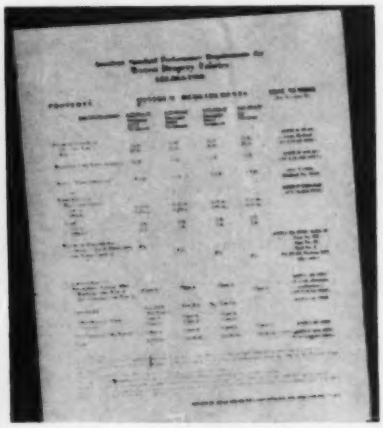


Figure 6

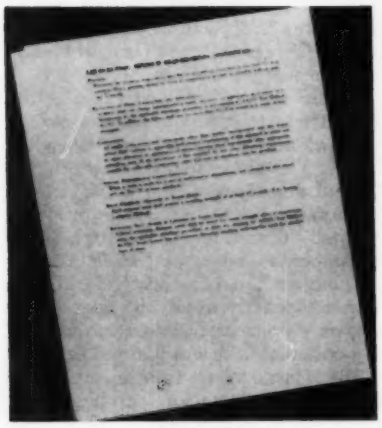


Figure 3

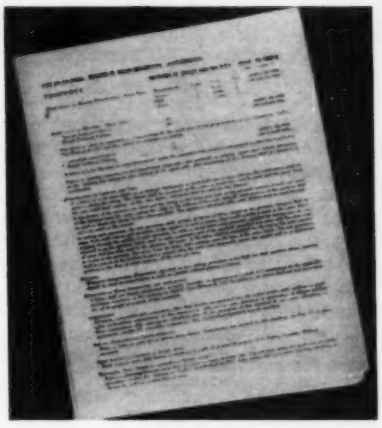


Figure 5

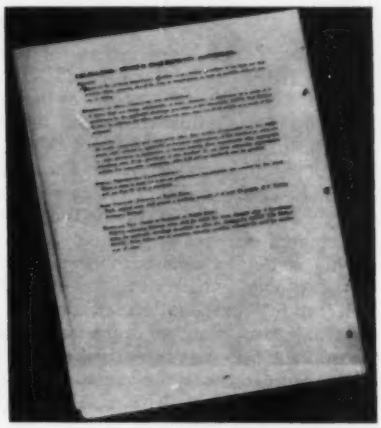


Figure 7

Linen Supply Association of America

National Institute of Drycleaning.

Technical Associations were repsented by

AATCC

ASTM.

Representatives of Government agencies, consumers, labor, independent laboratories as well as of the American Hotel Association and American Hospital Association and consumer goods publications also were active.

The enormous task of maintaining liaison among many and varied interests represented by these different groups was handled, most successfully, by George C Sommaripa, of the ASA staff and secretary of Committee L-22.

The presumably insurmountable problems which arose on occasion were often resolved through the objectivity of approach, the clarity of expression and the tact of Jackson E Spears of the Textile Distributors Institute.

To quote from the Introduction to ASA L-22, Volume 1, page 6. "Thus for the first time, it is possible to define and evaluate the essential performance qualities of any fabric for 75 basic end-uses, covering women's, girls', men's, and boys' wearing apparel and home furnishings. The performance requirements do not limit the style, construction, finish or other manufacturing details of the article. They cover such characteristics as breaking and bursting strength, shrinkage, colorfastness, retention of hand and appearance after refreshing, etc."

Particular consideration was given to laundering and drycleaning methods that would not damage the product.

Test methods incorporated in L-22 to evaluate performance requirements are those of the American Association of Textile Chemists and Colorists, American Society for Testing Materials, the Textile Distributors Institute, the U S Deparment of Commerce, as well as Federal Specifications and tests of individual companies, namely, American Viscose Corporation and the U S Testing Company.

Each of the test methods is fully described and the source of the method is set forth in Volume II of the Standards.

Volume I of the Standards is divided into six parts.

Part I of Volume I contains 38 American Standard performance requirements for women's and girls' textile fabrics;

Part II has 22 performance requirements for men's and boy's textile fabtile fabrics, and

Part III consists of 15 performance requirements for home-furnishing textile fabrics;

Part IV contains performance requirements for special characteristics and finishes, most of which are based on AATCC test methods.

Part V sets forth the American Standard requirements for permanent labels, detachable tags, and certifications of fabrics or products.

Part VI contains American Standard definitions of terms describing the various properties chiefly of tex-

tiles and of the finishes applied to them.

Volume II consists of 39 test methods to be used with the L-22 Standards. Of these, 23 are AATCC test methods, seven ASTM, three TDI, two CCC-T-191b, two American Viscose Corp, and one each for CS-59.44 and U S Testing Co.

MINIMUM STANDARD REQUIREMENTS

Each of the individual standards contained in Volume I, Parts I, II and III contains a table of Minimum Requirements such as are set forth under L22.10.23—1960 (see Figure 2) together with additional Minimum Requirements which did not lend themselves to the tabular form of presentation, shown in Figure 3.

Figures 2 and 3 are typical of the other ASA L-22 standards for Women's and Girls' Textile Fabrics.

Figure 4 contains a typical table of Minimum Requirements for Men's and Boy's Woven Rainwear Fabrics, L22.20.15-1960.

Figure 5 continues with the requirements of these fabrics. It should be of particular interest because of the length to which it goes in describing the preparation of samples for test. Also of great importance to the subject this evening are the minimum requirements for resistance to Water Penetration (Rain Tests)—a requirement which is not always observed.

Figure 6 shows a table of Minimum Requirements for Woven Drapery Fabrics, L22.30.6-1960. Figure 7 continues with these minimum requirements, which could not be reduced to tabular presentation but nevertheless, are important in helping to determine the acceptability of these fabrics.

While the ASA L-22 has been acclaimed by some associations and organizations in the textile field, others have been voicing opposition to these standards.

Among the objections heard are the following:—

1) Neither the mill, the converter, nor the dyer and finisher know with certainty the end-use of the fabric.
2) Describing the fabric in terms of one particular garment or other textile product tends to prevent it from being considered for other garments or products.
3) Some of the minimum requirements are too low.
4) Some of the minimum requirements are too high.
5) Manufacturing, as well as printing, dyeing and finishing processes cannot be controlled sufficiently to assure compliance.
6) The cost of providing all of the information necessary to ascertain compliance with any of the standards is prohibitive.
7) The term "performance" is objectionable. Instead the term "limit" should be used.

Other objections, many of them entirely irrelevant to the subject, are heard, but do not bear repeating.

The answers to these objections, which I submit for consideration by all concerned are these:—

1) The mill producing the gray goods need concern itself—if it so chooses—only with those elements in these standards which are applicable to such gray goods. It need make no reference to L-22 unless it cares to do so.

2) The converter is thus able to ascertain, by reference to L-22, the lines of products to which these goods might be adaptable. This should make it possible for him to have the gray good converted for various textile products. Also, he has the opportunity to decide the degree of colorfastness, dimensional stability, and special performance characteristics such as resistance to spotting and staining, wrinkle or crease resistance, crease or pleat retention, moth resistance, mildew and rot resistance, fire and flame resistance, colorfastness to sublimation, chlorine retention, "wash-and-wear" requirements that he wants built into any particular textile product.

He can do so either by enumerating his requirements in terms of each characteristic, which clogs the avenue of communication with a lot of road-blocking verbiage, or he can inform the finisher and dyer that the finished goods must meet the minimum requirements set forth in, for example, L22.10.23-W-1960.

Reference to the designation L22.10.23-1960 discloses it to be AS Perfomance Requirements for Women's and Girls' Woven Pajama, Pajama-Lounging, Nightgown, Dressing Gown, Underwear, and Negligee Fabrics. The letters WCH or D following the designation further inform the dyer and finisher that the goods must be machine washable at 160°F without bleach, or washable at 120°F or at 105°F without bleach, or that the product is not washable and may only be drycleaned.

When the ASA standard described above is used, misunderstandings are eliminated, the chance of error reduced, responsibility clearly delineated and costly returns lessened.

This clear avenue of communication by converters can well be compared to the careful driver on the modern turnpike or thruway, traveling toward his objective with confidence, born of the safety precautions he had taken.

The individual failing to avail himself of these precautionary measures can well be likened to the careless or indifferent or overconfident driver who feels that nothing can happen to HIM or that if it does, somehow or other he'll manage to squirm out of it.

3) In answer to the criticism that "some of the requirements are too low", it is important that we realize L-22 was the product of cooperative effort by representatives of many different organizations.

While it was clear to all that the object was to create minimum standards of acceptability, there arose, at times, the question as to where the line of demarcation should be drawn. Manufacturers of superior products wanted those lower limits raised. Proponents of the lower limits pointed to the comparatively few if any complaints involving poor quality, or procurement and manufacturing difficulties. It was pointed out that there was no restriction on the manufacture of superior products nor upon describing them as such. The final requirements were the result of a consensus of the members of the committee each of whom had full opportunity, as in all other matters, to vote for or against each individual requirement in each standard.

4) In answer to those who complained that the minimum requirements were too high, it was made perfectly clear that these standards were voluntary, not mandatory standards, and that there existed no law to enforce their use upon anyone, nor that require of textiles to be identified as conforming to L-22. It was also made perfectly clear, that these standards, or any portion of them, could be modified, should experience disclose the need for modification. Furthermore, American Standards are subject to periodic review, at which time such need for modification may be presented, by any interested party, for consideration by the Standards Board under whose jurisdiction the Standard was evolved.

Many stories can be told about the reasons given for the production and distribution of unsatisfactory mer-

chandise. I am sure that the telling of them would keep us here until the wee small hours of the morning. It cannot be denied, however, that whenever a requirement of the L-22 standard cannot be fulfilled for one reason or another, the person requesting compliance with L-22 should be so informed.

Also, it is important to know that those who have approved L-22 are not required to abide by it if they do not care to do so. To quote from the American Standard . . . "The explicable to all American Standards, does not in any respect preclude any party who has approved of the standard from manufacturing, selling, or using products, processes, or procedures not conforming to the standard."

5) This provision, which is applicable to all American Standards, recognizes certain basic realities. Nevertheless the mere existence of a standard provides an incentive toward careful rather than careless procurement, and production and communication procedures.

6) A more intimate and thorough knowledge of one's business is bound to result in a more profitable business. The existence of these standards helps provide a more intimate and comprehensive knowledge of the products as well as of the process and procurement problems of the textile industry. With the acquisition of such knowledge, the cost of providing such information must prove to be less, rather than more, and the profitability should be more rather than less.

7) The objection was raised to the use of the term "minimum requirements". The objector stated that the word "limit" should be used. I trust that pride of authorship has not reared its ugly head for, to the discerning person, it should be perfectly obvious that the lower limit placed upon a product, a performance characteristic, or anything else, becomes the minimum requirement.

Some folks have objected to commercial laboratories disclosing on their reports of test whether products meet or fail to pass L-22 standards. This appears to be a legitimate complaint—one of which commercial laboratories would do well to take cognizance. On the other hand, I would suggest that commercial laboratories inquire of their clients whether the latter desire to have reports allude to L-22. It the answer is "yes", then the commercial laboratories would, in my opinion, be rendering a worthwhile service in providing this information.

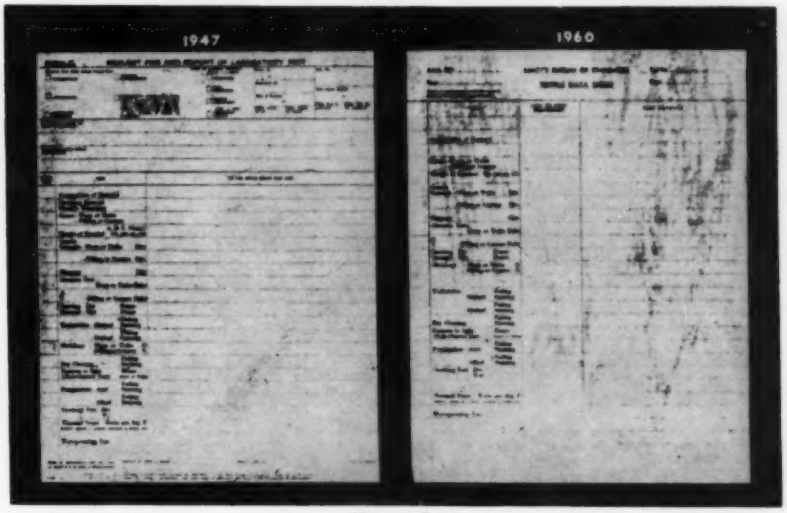


Figure 8

Unfortunately, reference to L-22 whether contained in a commercial laboratory report or in a company report can be misleading. Recently we saw a tag on a raincoat which referred to the fact that the finish on the coat was durable and that it passed the L-22 spray test. What the tag failed to disclose was the fact that the garment failed to pass the minimum rain test requirements for rainwear.

Whether this practice is to be permitted should be made the subject of study.

Although some textile fabric producers look askance at L-22 and upon any reference to these Standards by commercial laboratories, Macy's Bureau of Standards finds these standards to be very helpful. The fact of the matter is that we have had very little to do, insofar as alteration of our Report of Test Form is concerned, as you can see from Figure 8.

On the left you see the format used by us prior to the promulgation of L-22. On the right you will note that the change consists chiefly of a column in which to enter ASA or Macy Requirements for the particular textile product.

It may be of general interest to know that we have had occasion to reject merchandise which has not met L-22 minimum requirements. Also, in a number of instances, printers and dyers have informed us that if they had been informed of these requirements, the goods could and would have been finished to comply with L-22.

My answer to those who are opposed to L-22 is that L-22 provides an avenue of communication which permits of a factual, clear, safe, less costly and more rapid dissemination of information among all of the segments of the textile industry and that the intelligent use of L-22 should help promote the sale of textile products, reduce returns and increase profits for the capable producer, be he millman, converter, printer, dyer, finisher or textile product manufacturer.

And now since we have explored this subject of communication and the part L-22 plays in its being transmitted to the retailer, and eventually to the ultimate consumer, the question arises as to what does such a disclosure mean to the consumer.

While L-22 informs her that the product has met the minimum requirements for acceptability, the consumer really needs to know more than that, if returns, because of poor quality or alleged poor quality, are to be kept to a minimum.

Many complaints occur because customers frequently do not know how to take care of the things they buy.

Part V of L-22, as previously mentioned, provides for sewn-in or other permanently affixed labels, detachable tags and certifications of fabrics or products.

Unfortunately, Part V leaves much to be desired insofar as informing anyone as to how to refresh a textile garment or product.

It provides for color strips at least the full width or length of the label and not less than 1/16-inch wide. The weakness of this approach resides in the fact that the use of prescribed

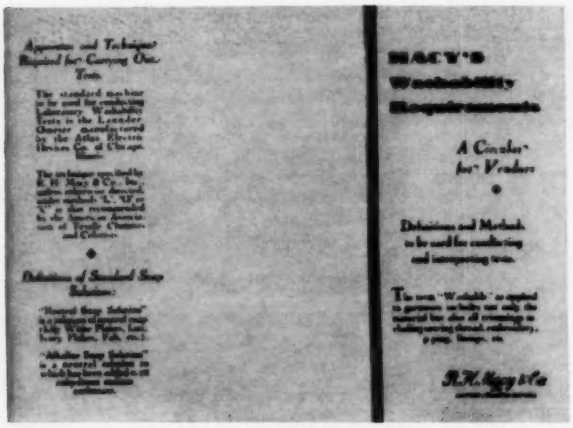


Figure 9

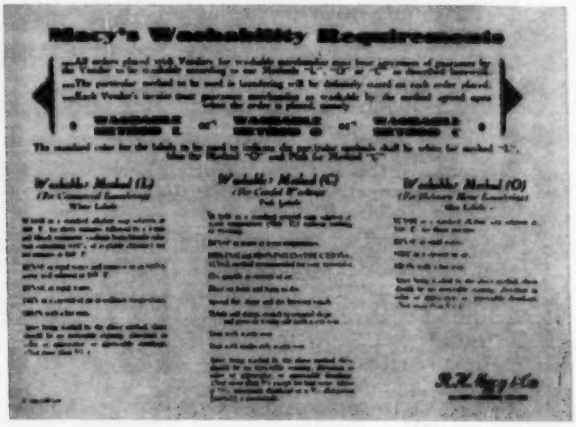


Figure 10

color may be contra-indicated, that the strip does not indicate whether the article is handwashable or machine washable, nor does it provide for a simple means of discerning whether a washable article is drycleanable.

While this American Standard does provide for additional language to be added to the sewn-in or permanently affixed label, this additional language together with the other information required by this Standard to be affixed to the product can increase the cost of labeling to a degree which may prove to be burdensome.

Therefore we find that cost of labeling, plus the written word, act as barriers to our carrying the message of refurbishing or refreshing textiles to the cutter, the retailer and finally to the consumer.

Let us go back again to 1928. Some of us old-timers remember that the problem of washfastness and of drycleanability assumed major proportions in the late 20s when the battle between silk and rayon waxed most furiously.

Until then, the industry had concerned itself principally with the task of determining what particular washing procedure would do the least damage to the textile fiber. It was common knowledge that harsh soaps, bleach and hot water would cause woolens to shrink, and silks to yellow, in addition to causing much staining and fading of colored goods.

In 1929, Macy's ran a full-page advertisement entitled "Macy's Washability Requirements", and distributed "A Circular to Vendors" containing these requirements. (Figures 9 and 10). Newspapers and magazines carried editorials and articles hailing this undertaking. Vendors, including DuPont and Continental Mills, hailed this progressive step in full-page advertisements. An extensive labeling program was undertaken and washability complaints dropped. Manufacturers and retailers alike noted with considerable satisfaction the improvement brought about by this direct approach toward solving an unprofitable situation resulting from the returned-goods problem.

As the various conditions to which textile products were subject in the home and in the servicing industries became more generally recognized, the need for additional information on labels became apparent.

The textile industry responded nobly, affixing washability tags containing much of the needed information. In Macy's more than forty different tags, labels and inserts were developed and affixed to much of our merchandise. Soon, the number of tags on garments began to increase, one for textile fiber identification, one for textile fiber promotion, one for washability, one for finish, one for the textile mill or converter, one for the garment manufacturer, one for the retailer and so forth. So that now, as many as six or seven tags or labels vie with each other on a single product, all of which are undoubtedly ripped off by the consumer and consigned to the trash basket without any of them being read. (Figure 11).

Figure 11

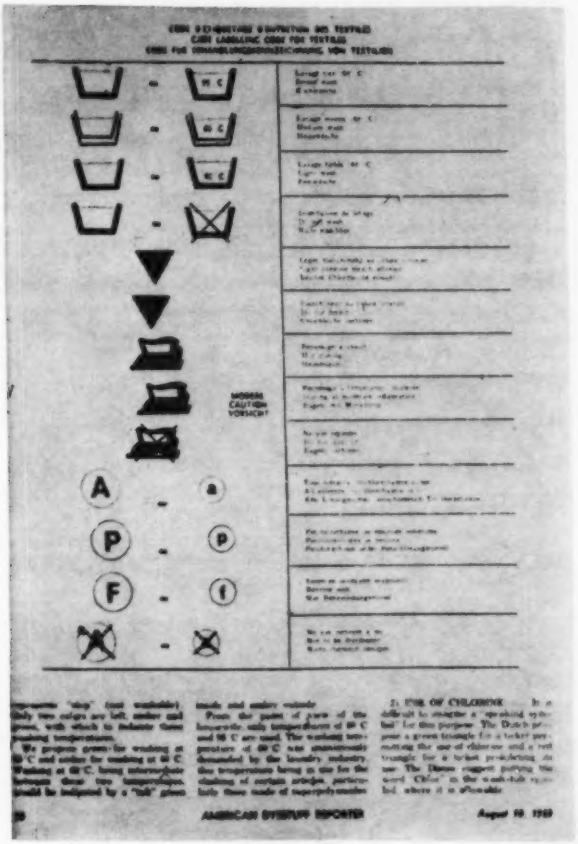


Figure 12

Figure 13

To make matters worse, a consumer buys a product and, looking at the textile fiber identification label, finds that it is made of a number of different fibers. She goes to her washing machine and finds settings for linen, cotton, rayon, silk, acetate, wool and what have you. She picks up her iron and finds similar settings. She looks at her garment, sheet, towel or other product again and finds it is made of a mixture of some of these fibers and others not mentioned on the washing machine or iron. What should she do? To make matters still worse, even though she may have guessed right the first time the next time she has to clean the product she can't find the washing instructions and she has thrown away the textile fiber identification label. With sheets and pillow cases and with towels, the hesitancy to buy colored goods is due in great measure to skepticism as to the colorfastness of the product to washing.

Recognizing the impact of this intolerable situation on all segments of the industry including the retailers and the consumer, The National Retail Merchants Association addressed itself to a means for correcting it.

While attending a conference on synthetic fibers in Gothenburg, Sweden in 1956, I became aware of an attempt on the part of dyestuff manufacturers to promote the use of a code for labeling textiles. This code was intended to be used throughout Europe. It evidently did not make much progress for a number of good reasons.

In 1959, I received a copy of an article appearing in the August 10th issue of the *American Dyestuff Reporter* entitled "Labeling Code for Textile Articles in Europe" (4). The translator of this article, P J Wood, stated that "all merchants were opposed to informative labeling."

We in the retail industry know that this is not so. In fact, the record proves to the contrary. We also know that the textile industry is not opposed to labeling. The question remained as to how we could solve the consumer's laundering problem and our return problem. The code as shown in Figure 12 falls far short of solving the problem for various reasons.

We have all seen traffic signs on the road. These signs, by their shape and by the symbols painted on them, tell the traveller at a glance, where he is going, or what he should do, or look out for. Figure 13 shows the international traffic symbols used in Europe.

The use of traffic signs and symbols has increased to such a degree in the United States that practically all Americans have become "Symbol Conscious".

Recognizing this fact, the Metropolitan Life Insurance Company last year ran an advertisement in "The Villager" of Greenwich Village, New York, featuring symbols as a means of carry a message—forcefully—to the public (Figure 14).

I won't burden you with a blow by blow description of the numerous meetings that have been held. But you should know that these Sure Care Symbols of which I speak have been accepted and endorsed and are being sponsored by the National Retail Merchants Association as an Association project. (Figure 15).

Figure 14

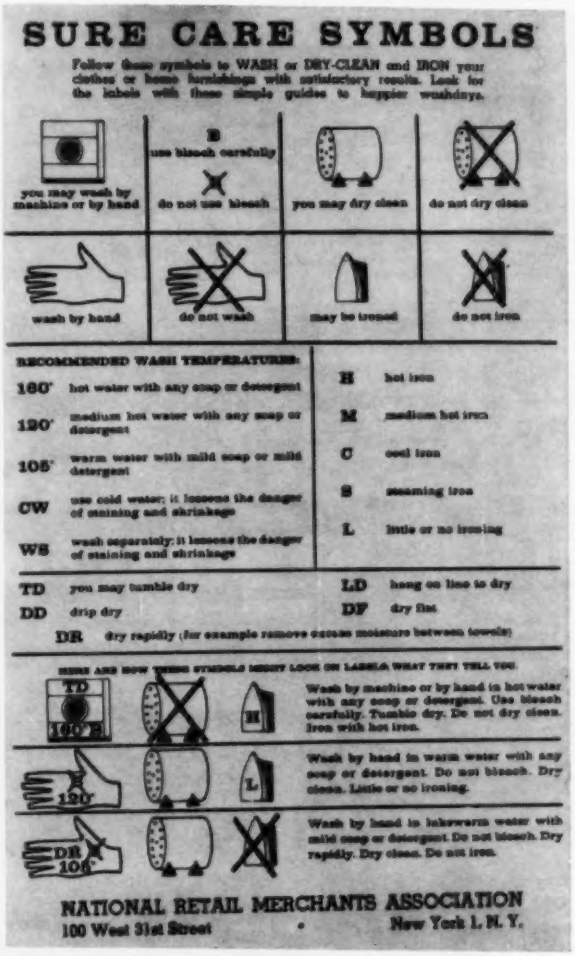

SURE CARE SYMBOLS
Follow these symbols to WASH or DRY-CLEAN and IRON your clothes or home furnishings with satisfactory results. Look for the labels with these simple guides to happier washdays.
you may wash by machine or by hand
use bleach carefully
do not use bleach
you may dry clean
do not dry clean
wash by hand
do not wash
may be ironed
do not iron
RECOMMENDED WASH TEMPERATURES:
160° hot water with any soap or detergent
120° medium hot water with any soap or detergent
105° warm water with mild soap or mild detergent
CW use cold water; it lessens the danger of staining and shrinkage
WS wash separately; it lessens the danger of staining and shrinkage
H hot iron
M medium hot iron
C cool iron
S steaming iron
L little or no ironing
TD you may tumble dry
DD drip dry
DR dry rapidly (for example remove excess moisture between towels)
LD hang on line to dry
DF dry flat
HERE ARE HOW THESE SYMBOLS MIGHT LOOK ON LABELS WHAT THEY TELL YOU
TD
160°F
H
Wash by machine or by hand in hot water with any soap or detergent. Use bleach carefully. Tumble dry. Do not dry clean. Iron with hot iron.
120°
L
Wash by hand in warm water with any soap or detergent. Do not bleach. Dry clean. Little or no ironing.
DR
105°
Wash by hand in lukewarm water with mild soap or detergent. Do not bleach. Dry rapidly. Dry clean. Do not iron.
NATIONAL RETAIL MERCHANTS ASSOCIATION
100 West 31st Street • New York 1, N. Y.

Figure 15

Figure 16

They have been shown to the folks in the dyestuff industry, to the representatives of the laundry owners, the drycleaners, the Textile Distributors Institute, the National Association of House and Daytime Dress Manufacturers, the National Knitted Outerwear Association, the National Association of Blouse Manufacturers and the National Association of Shirt, Pajamas and Sportswear Manufacturers. Both Lever Bros and Colgate representatives have seen them and appear to be very enthusiastic about them.

These symbols can be stamped, printed, sewed or cemented on to any textile product so that the consumer will know for the life of the product whether it is washable, drycleanable or ironable, and how to handle it.

Figure 16 shows Kaumagraph transfers on fabric made of a composite cloth of wool, silk, rayon, acetate, cotton, nylon and Orlon acrylic.

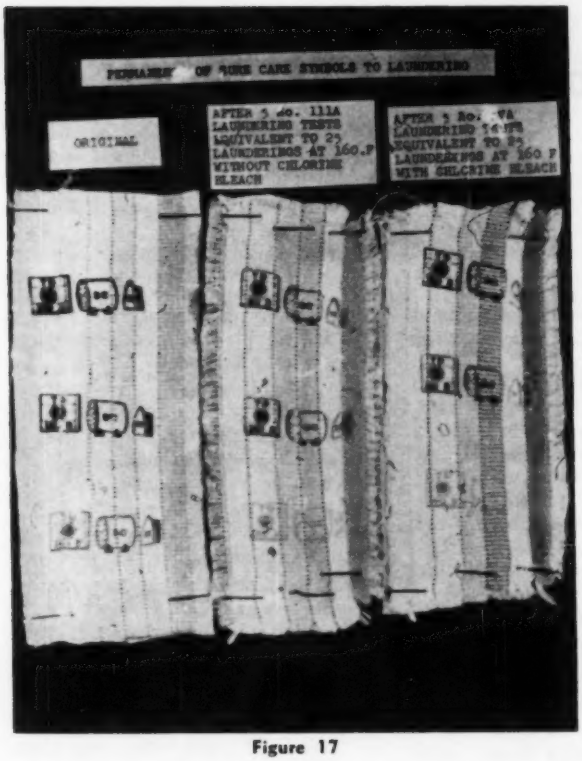


Figure 17

Figure 17 shows the permanency of these Sure Care Symbols to twenty-five washings with bleach and without bleach. So far only the black and red ink transfers are really durable.

Figure 18 shows how the Sure Care Symbols can be applied to the hanger of a garment. They can with equal ease be affixed to any part of any textile product, as for example, the tail of a shirt or blouse, the hem of a sheet or pillowcase, or towel or curtain or the lining of a jacket or trousers.

Having produced a simple and clear method for informing the consumer on how to wash or dryclean or iron her textile products, there remains the problem of getting manufacturers to so label their goods, and how to get the consumers to know what these symbols mean.

Figure 18

As stated previously, meetings have been held with some of the different textile manufacturing associations. The Laundry Equipment Manufacturers were brought up-to-date at their annual meeting last September. The National Retail Merchants Association has had printed up thousands of these educational charts entitled "Sure Care Symbols" and are making them available to manufacturers who will be permitted to reprint and circulate them with their products.

Many vendors have already expressed the desire to enclose these charts with their products so that consumers can post them in their laundries or kitchens. They say, that in addition to helping consumers, these symbols will also stimulate the demand for colored goods. These vendors are prepared to begin stamp-

(concluded on page 48)

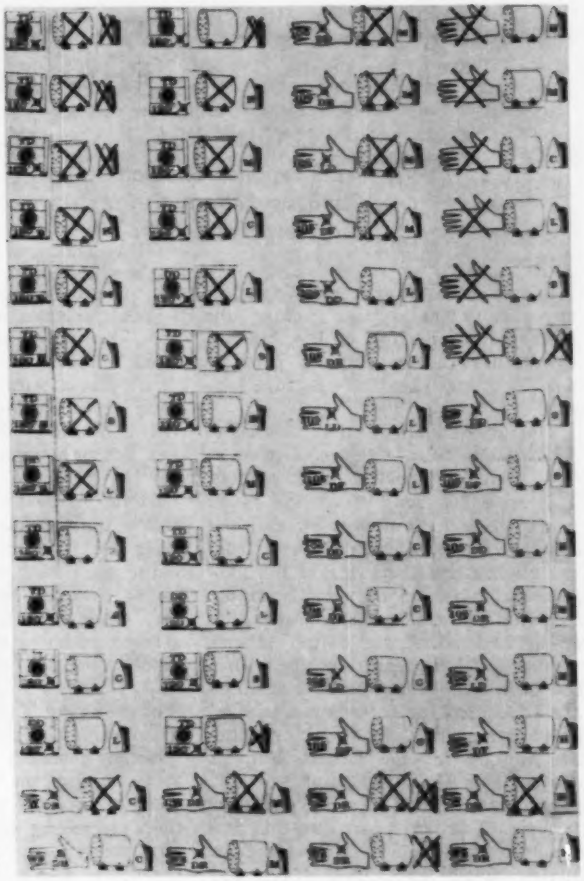


Figure 19

Metropolitan Section———

BOW AND SKEW*

LUCILLE REA and JOHN D ROBERTSON JR

Educational director
Simplicity Pattern Co, Inc
New York, NY

Mount Hope Machine Co, Inc
Taunton, Mass

Miss Rea: I am appreciative of this opportunity to appear before the Metropolitan Section of the AATCC to discuss the consumer's problem with bow and skew or off-grain fabric.

The film I have been requested to show is one from a series of twenty-five prepared for TV and schools. This series of films was made seven years ago and shows step-by-step the construction of a cotton dress, from the buying and preparing of the pattern and fabric to the final finishing. The film you will see is on straightening and shrinking cotton fabrics neither labeled preshrunk, nor with a special finish. This process is still being advocated for cottons not labeled as being shrunk and not having a finish applied for easy care, but, of course, this does not apply to our permanent-finished fabrics, synthetics or wool. The film preceding this one demonstrates general suggestions on buying fabric, explaining grain, and shows how to recognize the straight grain of fabric before purchasing.

(Films shown).

Today's fabrics with special finishes cannot be straightened by this process. Off-grain fabrics with so-called permanent finishes for wrinkle resistance cannot be so easily straightened, if they can be straightened at all. From letters received, teachers, 4-H leaders and the average consumer are trying to find the answer as to what can be done to make this fabric acceptable in clothing.

A few say the situation is somewhat improved; but from most comments, it would appear that the problem is still there. The problem is not just with cottons, but also synthetics, wools and blends. It is not always the cheaper fabrics that are the offenders, for some have said they bought the higher-priced fabrics thinking they would be on-grain, but found that they, too, were off-grain. This would indicate a willingness on the part of some consumers to pay a little more for fabrics if they could be sure they were straight.

What are the teachers doing about it? They are, first of all, showing their classes examples of off-grain fabrics and telling their students to look at the grain when buying and, if it is bowed or the crosswise threads are not perpendicular to the selvage, not to purchase the fabric. Prints, designs, stripes or plaids that do not follow the yarns are also taboo. If the girls bring any of these to class because their mothers had them in the house, and the girls cannot afford to buy other fabrics, there is the decision to make as to whether to cut a dress according to the grain or the design. Either way, the dress will not look or hang right, and it leads to discouraging results.

Some teachers work with their students, having them cut the end along a crosswise thread to straighten, then stretching the yardage diagonally and steam pressing; or wetting the fabric and pressing it dry to try to straighten the fabric. This does not usually correct the situation, however, —much time and energy has been spent and the girl is discouraged before she ever learns the joy of sewing. Too, the pulling of a thread across the fabric and cutting along this thread to establish the crosswise grain is time consuming and results in waste. Some lose as much as ¼ yard in the process. Many teachers plead for the store to tear the fabric from the bolt to avoid waste, but as you know, some fabrics can't be torn and others are apt to start ripping down a lengthwise thread. It seems to be a general store policy to cut the yardage from a bolt.

Some teach to cut pattern pieces individually to get a less distorted grain. One teacher wrote that, for sleeping garments, they follow grain —for outer garments, if the print is not too much off, or if it is a small print, she sacrifices the grain and follows the print.

Many times fabric that is badly off-grain is returned to the store—with varying results. Here are some direct quotes from teachers regarding this:

1) "They are courteous and listen to the problem, but I don't think the complaint is ever referred to the manufacturer."
2) "I don't believe stores usually consider off-grain fabrics their responsibility. Some refuse to tear fabrics that could easily be torn because off-grain shows up readily that way."
3) "In most cases, they are given other material."
4) "Department stores are usually cooperative; fabric shops would rather not bother. One store manager told a student that if she 'insisted' on straightening the fabric she should have bought an extra ¼ yard of material. This fabric was priced at $2.98 per yard."
5) "I have not complained to stores directly. I do not purchase off-grain fabrics for my personal use."
6) "In sewing I used wool for the first time making a tailored suit. Many problems arose, including getting an off-grain material which the store would not take back. I wrote to the manufacturer explaining the situation, and they were kind enough to send me an identical piece of material of top quality. Believe me, I'm pretty careful about checking the material grain before I buy."

Complaints on Stores:

1) "Teenagers get very little consideration."
2) "Clerks tell the girls that the teacher is being too particular."
3) "Some stores are courteous and help students find on-grain fabrics."
4) "Large department stores handle off-grain problems satisfactorily; smaller outlet stores make adjustments rather difficult."

Several years ago one store in the midwest told me it had stopped handling printed plaids, stripes, and blocked designs, for their customers would not buy them when they were off-grain.

*Presented before the Metropolitan Section at Kohler's Swiss Chalet, Rochelle Park, NJ, on Apri 21, 1961

How extensive is the awareness of this problem? Statistics on the number of pupils in schools, 4-H groups and adult groups will show you to what extent respect for grainline is being taught each year.

We have a magazine, *Modern Teacher,* being sent to 50,000 home economics teachers and extension workers; and a second magazine, *Modern Miss,* available to their clothing students. At the present time we are mailing 2,500,000 copies of *Modern Miss* and have not nearly filled all the requests.

There are approximately 700,000 4-H girls taking a project in clothing. As yet, not all 4-H girls are receiving a copy of *Modern Miss* magazine; thus, not all are included in the above figure.

There are about 118,000 college and university students majoring in home economics. Not all of these are clothing majors, but the majority have had some courses in clothing.

The adult education group is growing rapidly. There is no total available for the United States, but these reports from two cities will give you some idea of the interest. In one city there are 7,900 women enrolled in some type of sewing class. Another city has 60% of its total enrollment of 4,000 in clothing-construction classes. These figures should give you a picture of the number of people getting training on the fine points of buying fabrics.

Aside from these figures, a report from a clothing information day in California with 700 women in attendance states that the off-grain failure was one of the top problems about which the consumer would like to have something done. This complaint has come up at similar meetings over the country. The complaint was presumably passed on to the manufacturers. In a recent report from such a consumer's group, it seems that they have now taken the attitude of just not buying the fabric rather than trying to get complaints heard. Another letter on this subject says "as long as people will continue to buy off-grain, whether pressed or printed, that's what we'll have on the market. We try to teach not buying it, but there just isn't much choice." People do need fabric, so they just try to make the best of it.

Most educators seem to realize that manufacturers have problems in getting fabrics with perfect grain, but they would like to know, just what is a reasonable tolerance for first-quality fabric?

If any manufacturer could establish a guaranteed straight grain or a reasonable tolerance, or a guarantee of absolute permanence of finish, and advertise this fact to schools and extension groups, he would get quite a following. The consumers do appreciate the wonderful strides made in the textile industry, and they like the convenience of permanent finishes on fabric. But, they would also like to see advancement in producing fabrics with straight grain.

* * *

Mr Robertson: Mr Chairman, ladies and gentlemen, guests and members of the Metropolitan Section. Being invited to speak before the AATCC is a real privilege, and a pleasure in itself, but I am particularly pleased that you have asked me to speak on a subject that is so very important to everyone in the textile industry.

I, myself, an no home-sewer. As a matter of fact, I'm a poor sewer away from home.

Miss Rae strikes me as being a pretty capable sewer at home or away. She's convinced me that the sales of yard goods for home sewing would really increase if all material reached the retail outlets free of bow and skew.

Textile finishers are acutely cognizant of this headache. Look at the millions of yards of material that are rerun annually to meet present consumer specifications. There are no profits in reruns, but if cloth comes out of processing distorted there are no sales without reruns.

What are textile finishers doing to meet these demands? Let's take a look.

They are organizing rigorous, periodic, preventive maintenance programs. They are seeking professional maintenance advice. Breakdown is anticipated and replacement components are ordered ahead.

One modern plant has listed every single electric motor, and established a routine for inspecting each unit within the time recommended by the manufacturer. Another has itemized over 5,000 friction surfaces, and set up a schedule, with the help of a lubrications engineer, to hit each one a lick just when it's supposed to need it.

What has this to do with bowed and skewed fabric? A worn bearing that allows a roll end to drop an ⅛ of an inch can cause up to a ¼ of an inch bias depending upon the cloth-wrap around it.

If a frozen bearing locks a steel roll, cloth must be dragged around it. The wetter portions of the cloth have higher traction, and hence are stretched more than the dryer sections. If this moisture difference is across the width of the piece, distortion of the filling can result.

Preventive measures, unfortunately, are still not the complete answer. In spite of the most thorough engineering, the newest finishing plants have bowed and biased cloth problems too. Today's answer lies in the addition of automatic correction prior to the last drying, or setting operation.

Many textile mills have contributed to the advancement of automatic straightening by investing in new automatic controls as they appeared on the market. They have further supported this development by contributing many hours of productive range time while cooperating with designers and equipment manufacturers.

Before discussing the evolution of the automatic control for filling straightening, let us look at some types of fabric-distorting influences which occur during manufacturing and finishing.

During slashing and beaming, unequal warp tensions will create slack selvages and filling distortions while finishing.

During rope processing, one portion of the cloth is exposed, while the rest naturally is buried. The exposed portion is subjected to localized tensions during travel through pot-eyes and turn-around rolls. While turning sharp corners, the outside of the rope must travel further than the inside. This action introduces distortion.

During processing in open width, roll misalignment and machine misalignment creates skew. Unequal pressure across the nip of a pad will allow one selvage to inch ahead with respect to the other. Too high a crown will retard the center, creating bow.

Throughout all operations a bad seam will distort both pieces for 10 to 20 yards either side of the seam.

Not too many years ago, some of the devices used for straightening distorted cloth during finishing processes were difficult and tiring to operate, and very slow in response.

We now know from observing the continuous corrective action of our latest automatic controls that filling distortion is constantly changing. It's little wonder that manual filling-straightening devices are gradually being automated, or replaced due to

increasing labor costs, production speeds, and demands for higher quality.

The first step in the evolution of the automatic filling straightener was the motorizing of the hand screws on differential tenters and tilting rolls. This improvement enabled the operators to control the straighteners by push-button while gaining quicker corrective action.

In the early 1930s, Winsdor & Jerauld Mfg Co approached General Electric Co and interested it in developing an automatic control for the former's differential tenter frames. The device that was developed was a scanning-disc-type control known as the GE T-105.

The differential tenters were largely used on sheeting ranges ahead of dry cans. The material was straightened while still damp in the frame before final drying on the cans.

However, the T-105 control was expensive and complicated. It required a lot of maintenance. In addition, the control zero had to be set while *straight* cloth was running through the frame.

The next automatic control to be developed was one based on the reflected light principle. It was less complicated, with a more easily set zero reference. However, one disadvantage of this control was the necessity of resetting the controls for each change in quality.

Not long thereafter, a new control was introduced known as the transmitted light system. Initially there were two light sources, one on each selvage, which passed light through the cloth. The light intensity received by the two photoelectric heads behind the cloth was compared and the difference indicated the skew.

However, non-uniform aging of the lamps caused erroneous signals, as did plaid patterns, when one light was opposite a dark section of material and the other opposite a light section. To counteract this disadvantage, a multi-mirror modification of the transmitted light system was developed which utilized a single light source.

Another type of automatic control was later introduced which responded to fluorescent-oil-dipped yarn woven into the fabric at certain intervals. This means of detection was rendered inoperative with the application of fluorescent dyes which obliterated the woven stripes.

General Electric, by this time, gave up the general sale of the T-105 control, although modifications of it by other manufacturers are still on the market.

In 1957, a different type of detection system was introduced. It sensed filling distortion by mechanically feeling a related, artificially induced warp distortion. It worked well on even fancy, nonrectilinearly woven fabrics, but detected only skewed filling. Although bruising of delicate sheers by the mechanical system has been experienced, continuing research has indicated a solution.

Recently, a new-type optical control which could detect both bowed and skewed filling was introduced. Although limited to translucent, square-woven material, it was not affected by light and dark sections of plaids as was the problem with earlier optical designs.

The latest development in the autimatic control of filling distortion is a complete package of a bowed and skewed filling straightener automated by both this latest optical control, and the electro-mechanical control, which now has been designed to detect bow as well as skew. This package provides complete flexibility in handling all of today's styles and qualities with assurance that it will straighten all of tomorrow's, also.

I would like to conclude this talk by showing you a movie which explains the principle behind electromechanical detection sytem. Although the film discusses the detection of skew only, bow is now detected by breaking it down into two skews, which are detected by two detectors.

(Mr Robertson concluded his presentation with a film entitled "The Skew Liner," which illustrated an electromechanical detection principle of one of his company's automatic controls.)

Performance Requirements for Textile Fabrics———

(concluded from page 45)

ing or labeling their products with these symbols.

The Kaumagraph Company and undoubtedly a number of printers will have sheets similar to those shown in Figure 19 so that vendors can encircle the particular washing, drycleaning or ironing instructions desired to be conveyed to the consumer.

Daily News Record of Thursday, October 27 carried an article entitled "Washability Symbol Code Set by NRMA". This article has already brought favorable response from manufacturers. The *Insider's Newsletter* of November 7, a "Monday report for busy WOMEN who need to know what's going on", published by Cowles Magazines, Inc, devotes almost a page and a half to this topic. Its introductory statement is . . . "The best fabric news since nylons is about to unfold".

T Eaton & Co of Canada phoned and asked and received permission to circulate Sure Care Symbol information to all of its executives. I was informed that it was their top-level decision that their buyers request their vendors to use them.

NRMA is proceeding with an excellent educational program, which at first is being directed to all of its members. It is also planning other activities, all of which will have as its objective a nationwide acceptance of Sure Care as rapidly as the various branches of the textile industry can affix these symbols to their goods.

And, to further disclose the rapid progress of this Sure Care Symbols program, I thought you might be interested to know that the Nov 12 issue of *Business Week* carries an article on Sure Care Cymbols with some interesting favorable comments about them.[1]

[1]Since the author delivered this paper, additional articles on Sure Care Symbols have appeared in the following publications: February, 1961: *Style* (Canada), *Department Store Economist, Printers' Ink*; March, 1961: *Changing Times, Journal of Home Economics, Good Housekeeping*, and *Look*; June, 1961: *Stars and Stripes*.

It is hoped that those of you who print, dye and finish textiles, will make use of these symbols so as to inform your customers regarding the way in which consumers are to wash and/or dryclean and if necessary how to iron the goods you finish.

By doing so, you will help increase the demand for dyed and printed goods and for goods with special finishes; you will help reduce consumer dissatisfaction resulting from improper care of textiles; you will assist in the elimination of returns to your customers, and your customers' returns to you—all of which should result in a more profitable textile printing, dyeing and finishing industry.

LITERATURE CITED

(1) Freedman, E, "Examining Textiles from the Retailers' Point of View", *Am Dyestuff Reptr* 17, No. 5, 190-4 (March 19, 1928).
(2) Freedman, E, "A Proposed Method for Describing Washable Materials and Garments", *ibid* 18, No. 6, 220-6 (April 1, 1929).
(3) Freedman, E, "The Research Chemist Looks at Consumer Textiles", *ibid* 21, No. 13, 388-92 (June 20, 1932).
(4) Ringeissen, M, "Care Labelling Code for Textile Articles in Europe", *ibid* 48, No. 16, 29-31 (August 10, 1959).

COUNCIL; NATIONAL COMMITTEES

Sept 26 (Statler Hotel, Buffalo, NY); Council (8 PM)

Oct 26-27 (Sheraton Hotel, Philadelphia, Pa); TCR, research and administrative committees

Nov 17 (Hotel Sherman, Chicago, Ill); Council and Annual Meeting (2 PM)

Jan 26 (Hotel Commodore, New York, NY); Council (10 AM)

Apr 12-13 (Francis Marion Hotel, Charleston, SC); Council, administrative and research committees

NATIONAL CONVENTIONS

Sept 27-29, 1961 (Hotel Statler, Buffalo NY); Nov 14-17, 1962 (Atlanta Biltmore Hotel, Atlanta, Ga); Oct 30-Nov 2, 1963 (Boston, Mass); Oct 1-3, 1964 (Hotel Statler, New York, NY); Oct 14-16, 1965 (Conrad Hilton Hotel, Chicago, Ill); 1966 (Philadelphia, Pa)

DELAWARE VALLEY SECTION

Sept 15 (Wilmington, Del); Oct 27, Dec 1 (Beck's Restaurant, Philadelphia, Pa)

MID-WEST SECTION

Nov 18 (Chicago, Ill)

AATCC Calendar

NORTHERN NEW ENGLAND SECTION

Sept 8 (Annual Outing); Oct 20 (Quartermaster R & E Command, Natick, Mass); Dec 18 (Motel 128, Dedham, Mass); Jan 19 (Woodlawn Country Club, Newton, Mass)

NORTHERN PIEDMONT SECTION

Oct 7 (Hotel Roanoke, Roanoke, Va)

PACIFIC NORTHWEST SECTION

July 29 (Outing—Welches, Mt Hood, Ore); Nov 10 (business meeting)

PACIFIC SOUTHWEST SECTION

Sept 30 (outing), Nov 17

PALMETTO SECTION

Sept 15-16 (Clemson House, Clemson, SC); Jan 20-21 (Poinsett Hotel, Greenville, SC); April 14-15, 1962 (Francis Marion Hotel, Charleston, SC)

PIEDMONT SECTION

Sept 23 (Hotel Barringer, Charlotte, NC); Jan 27 (Hotel Charlotte, Charlotte, NC); Apr 7 (Hotel Barringer, Charlotte, NC); June 8-9 (1962 Outing—Mayview Manor, Blowing Rock, NC); Sept 29, 1962 (Hotel Barringer, Charlotte, NC)

RHODE ISLAND SECTION

Sept 15 (Management Meeting); Oct 17 (Dinner Meeting); Dec 1 (Annual Business Meeting)

SOUTH CENTRAL SECTION

Sept (Hotel Patten—tentative)

SOUTHEASTERN SECTION

Sept 9 (Ida Cason Gardens, Pine Mountain, Ga); Nov 25 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

Sept 15 (Plant visitation); Oct 27 (Annual Meeting) Dec 1 (Shelton, Conn)

Membership Applications

June 22 - July 5, 1961

NEW ENGLAND REGION

Northern New England Section

Senior

Gerald E Quinn—Chief chemist, Carter's Ink Co, Cambridge, Mass. Sponsors: W W Pennock, G Blyth Jr.

CENTRAL ATLANTIC REGION

Delaware Valley Section

Senior

Chloe R Eichelberger—Lab manager, The United Piece Dye Works, York, Pa. Sponsors: A C Tressler, E Empting.

Metropolitan Section

Senior

David R Cooke—Specialist, consumer products dev, The Chemstrand Corp, New York, NY. Sponsors: T L Rusk Jr, R P Nirenberg.

Associate

Hilda Feinberg—Librarian, Revlon Inc, New York, NY.

Junior

Patricia R Dougherty—Home agent of Bergen County Extension Service, Hackensack, NJ.

SOUTHERN REGION

Northern Piedmont Section

Senior

Siegfried M Kinzinger—Vice president, research & development, Glenoit Mills, Tarboro, NC. Sponsors: M C Harmon, G R Turner.

Earlie S Leonard—Dyer, Crown Hosiery Mills, Inc, High Point, NC. Sponsors: J W Van Loan, F C Munday.

Transfer to Senior

Richard P Barber—Director of chemical research, Burlington Industries Inc, Mooresville Mills Div, Mooresville, NC. Sponsors: W D Moss Jr, Carl R Neal.

Chia Ren Jin—Research chemist, Textile Research Center, North Carolina State College, Raleigh, NC. Sponsors: W R Martin Jr, H A Rutherford.

Piedmont Section

Senior

Doyle R Harper—Development chemist, Celanese Fibers Co, Charlotte, NC. Sponsors: G A Wallace, J E Torbet.

Lee J Slusher—Sales mgr, southeastern district, W R Grace & Co, Nitrogen Products Div, Charlotte, NC. Sponsors: S P Young, B M Keever.

Transfer to Junior

Elbert S Mullis—Supv trainee, Cone Mills Corp, Granite Finishing Co, Haw River, NC. Sponsors: R O Coley, W H Ritter.

Southeastern Section

Senior

Clifford M Moran—Research chemist, USDA, Southern Regional Research Lab, New Orleans, La. Sponsors: S L Vail, R M Reinhardt

AT LARGE

Senior

Fredrik G Derk Meijer—Chemical research & development in textile finishing, Koninklijke Twentse Stoomblekerij NV, Goor, Holland.

Kazuo Kondo—Chief of 2nd division, dyeing & finishing, The Textile Research Institute of Japanese Government, Yokohama, Japan.

Rolf Gross—Specialist in the dyeing of wool and synthetic fibers, Sandoz Ltd, Basle, Switzerland. Sponsors: C H A Schmitt, T W Luthy.

Associate

Carlos Bueno—Director-president (chairman), Herga-Industrias Quimicas S A, Rio de Janeiro, Brazil.

Elected to Membership

July 12, 1961

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
*indicates transfer from another class of membership

NEW ENGLAND REGION

Rhode Island Section

Richard H Ashworth

CENTRAL ATLANTIC REGION

Delaware Valley Section

Frank C Card

Metropolitan Section

Sam Chrisman
Michael M Machida (A)

SOUTHERN REGION

Southeastern Section

Robert T O'Connor
William R Wactor (A)

AT LARGE

Siti Suparti
Ahmed K Wahbi
*Gerard Jacob**

STUDENT CHAPTER

Georgia Institute of Technology

William R Holmes (S)

AATCC—Deceased

Member	*Section*
STANLEY W FREEMAN 196 Country Club Dr Warwick, RI	RI

Activities of the Local Sections

Delaware Valley

DELAWARE VALLEY SECTION held its 1961 outing on Friday, May 19, at the North Hills Country Club, North Hills, Pa, with 350 members and guests in attendance. The feature event of the day was the initial golf match between teams representing the Delaware Valley and Metropolitan Sections. Six golfers represented each section, with two golfers from each team playing in the respective Class A, Class B, and Class C Divisions. Delaware Valley won the match on its "home grounds" 8 to 1, but lost to the Metropolitan Section in a return match at the North Jersey Country Club in June by a 9 to 0 count.

Ed Smith, low gross winner

In the first match, in the Class A Division, Ed Smith and Rod Parvin of Delaware Valley defeated Roy Hamilton and Sam Chrisman of Metropolitan, 3 to 0. In Class B, Fred Rosenberger and John Phillips of Delaware Valley defeated Charles Germanetti and Ruddy Malizia of Metropolitan, 3 to 0. In the Class C Division, Tom Flynn and Clarence Seibert of Delaware Valley defeated Fred Hennessey and Charles Cooper of Metropolitan, 2 to 1.

In all, there were 150 golfers at North Hills. Two awards were made to members of the Delaware Valley Section, one consisting of a sterling silver tray for low gross, and the Fancourt Cup for low net. Ed Smith turned in a low gross of 80, and J

Class A Division Intersectional Match, l to r: Rod Parvin and Ed Smith, Delware Valley Section; Sam Chrisman and Roy Hamilton, Metropolitan Section

Class C Division Intersectional Match: l to r, Charlie Cooper and Fred Hennessey, Metropolitan Section; Tom Flynn and Clarence Seibert, Delaware Valley Section

Outing Committeemen, l to r: Niels Jensen, reservations; Ernst W Empting, reservations; A E Raimo and W W Gleadall, cochairmen; Frank A Mather, publicity

L to r: Mike Frank, Harry Kerr, Dick Daily, Pete Hankins

W W Cleadall (left), outing cochairman, looks over a group of golfers signing in for starting time

L to r: Frank Morressy, Phil Orser, Charles Kuzma, Charles Baeringer

McFarlane won the Fancourt Cup.

Among guests, significant low gross awards were won by D Bloomberg with a score of 75, Irv Kreindel with a gross of 76, T Farese with a 77, and John Phillips with an 81.

The award for being closest to the pin on a selected par-3 hole went to Al Vint, who came within 21 inches of the cup. The putting contest was won by Larry Hoffner, with a total of 33 for 18 holes.

In addition to the golfing activities, members and guests participated in quoits, darts, and cards. The following teams finished 1-2-3 in quoits: Herb Brewster and John Carter, Joseph Clark Jr and Thomas Scanlon, Sam Guertin and Walt Reed. The three winners in darts were Jim Lord, Bob Reiner, and Mike Frank. The three winners in cards were Stanley Trask, Charles Tier, and Charles Schappell.

Door prizes, donated by friends of the Delaware Valley Section, were awarded after dinner.

•

Metropolitan

METROPOLITAN SECTION held its 1961 [illegible] last month at the North Jersey Country Club with approximately 360 in attendance.

A six-man team from the Metropolitan Section, having lost to a rival team from the Delaware Valley Section at the latter's outing in May, regained its lost dignity with a 9 to 0 win. Representing the Metropolitan Section on this occasion were Al Martinelli and Roy Hamilton (Class A), Charles Germanetti and Charles Greischel (Class B), and Fred Hennessey and Charles Cooper (Class C).

Al Martinelli, Vitromar Piece Dye Works, took low gross honors for the day among members with a 69. Bob Lanino, Sonneborn Chemical & Refining Co, turned in low gross among guests with a 73.

Low net prize was awarded Jack Guitterrez, Concord Dye & Finish Co.

Winners in other events were:

Closest to the pin—Jules Devigne, Interchemical Corp

Longest drive on No. 18—Shrimp Myers, Klopman Mills

Putting—Irwin Kreindel, Allen Dyeing Co.

Edward Bobilin, Sandoz, Inc, served as chairman of the outing. He was assisted by Charles Germanetti, Vivatone, Inc; Gerard Heine, Koppers, Inc; William Ferrazano, National Aniline Div; Eugene Grady, Jacques Wolf & Co; and Richard E Miller, Eastman Chemical Products, Inc

•

Northern New England

PLANS for the Annual Outing of the Northern New England Section have been completed by Cochairmen Donald H Thomas, National Aniline Division, and John Markgren, W C Durfee Co, Inc.

This all-day event is scheduled for Wachusett Country Club, West Boylston, Mass, on September 8. The planned activities and committeemen for each are:

Golf—John Ormiston, Sandoz, Inc; David Collins, Atlas Color and Chemical Co

Putting—John Signorino, Ciba Co, Inc

Softball—John Murphy, United Aniline Co

Fly Casting—Walter Worsman, Sandoz, Inc

Horse Shoes—Hans Walz, Sagamore Color and Chemical Co.

Prizes for all of the sporting contests will be awarded at the dinner, which is scheduled for 7:00 pm. Dinner is to be preceded by a cocktail hour. Reservations may be obtained by calling either of the cochairmen at their Boston office; Capitol 7-9240 for John Markgren, or Capitol 7-0490 for Don Thomas.

Palmetto

JOHN B NEELY, chairman of the Nominating Committee for the Palmetto Section, has submitted the following list of candidates for sectional offices in 1962:

Chairman—Neal A Truslow

Vice Chairman—Thomas McIlwain

Treasurer—William F Baldwin

Secretary—J H O'Neill

Councilors—J C King, Linton C Reynolds, Richard E Rettew

Sectional Committeemen—Wilbur Hammett, Ted Giard, Leonard Stanley, Jack H Emerson.

•

Western New England

WESTERN NEW ENGLAND SECTION held its annual outing at the Wallingford Country Club, Wallingford, Conn, on June 9 with 72 in attendance.

Apparently it does not rain on a a golf course, for, despite inclement weather, the turnout was a good one.

•

Pacific Southwest Section

THE far-flung Pacific Southwest Section served its members in two areas in May with meetings on May 17 in San Francisco and May 19 in Los Angeles. On both occasions, Albert Bagian, Morton Machine Works, was the speaker.

As reported in the July 10 issue, fifty-five members and guests turned out at the Fior D'Italia Restaurant in San Francisco to hear Mr Bagian speak on "Wet Processing Equipment and Textile Machinery".

Sixty-five member and guests enjoyed the hospitality of the Pabst Brewing Company in the brewery's Mission Room in Los Angeles on May 19, at which time Mr Bagian spoke on "Pressure Dyeing and Package Machines".

Albert Bagian,
Morton Machine Works,
guest speaker

PACIFIC SOUTHWEST SECTION MEETING

•

May 19, 1961

•

Los Angeles, Calif

(See report on preceding page)

Angus H Roberts,
Nopco Chemical Co,
Pacific Southwest Section chairman

61-14

Education: BS, textile chemistry, North Carolina State College

Position desired: Mangerial in printing or finishing plant

Location: Southeast

Age: 45; married; excellent references

7-10, 7-24

61-15

Education: MS, textile chemistry; MBA, marketing

Position desired: Market research analyst in textiles and related fields

Location: Anywhere in US

Age: 30, married; excellent references

7-10, 7-24

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks may be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

61-16

Education: BS, Clemson College.

Position desired: 1) Development work; 2) technical sales; 3) management and liaison duties. No commission selling. Interest not limited to textile industry. Enjoy reasonable travel.

Location: Any state having no income or intangibles tax, as NJ etc, desired. Any state or country having reasonably healthy living conditions acceptable.

Age: 54; married; excellent references.

7-24, 8-7

Softness sold this towel...

and CARBIDE's amines gave it that softness

Textile softeners, based on CARBIDE's amines, give linens and cottons the softness that makes them sell. And, with the complete selection of amines available from Union Carbide, you can make textile softeners that give the right kind of softness for best sales appeal in finished goods. Cationic mill-softeners, prepared by fatty acid esterification or amidification of CARBIDE'S amines, offer a full range of softening effects. Here are seven amines for your evaluation:

- Triethanolamine
- Diethanolamine
- N-Aminoethyl Ethanolamine
- N-Methyl Diethanolamine
- Diethylene Triamine
- Dimethylamino Propylamine
- Diethylamino Propylamine

Remember, whether you need amines . . . UCON textile lubricants . . . anti-foaming agents for scouring and mercerizing . . . water-insoluble solvents to achieve deeper and fuller shades in dyeing . . . monomers for fiber syntheses . . . ethanolamines and TERGITOL nonionic surfactants for detergents . . . or other organic chemicals for finishing agents and lubricants . . . you'll find them at CARBIDE. With more than one hundred CARBIDE textile chemicals to choose from, you can take advantage of the increased savings of bulk buying in mixed tank car and mixed tank truck lots, or mixed carload lots in drums.

For information and help from experienced Technical Representatives, call your nearest CARBIDE sales office or write to: Union Carbide Chemicals Company, Division of Union Carbide Corporation, Dept. J, 270 Park Avenue, New York 17, N. Y.

TERGITOL, UCON and UNION CARBIDE are registered trade marks.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

Kinds of "Neps" in Dyed Cotton Piece Goods———

(concluded from page 26)

which fuzz fibers, or linters, from particles of seed-coat were present with immature fibers, and occasionally a deformed fiber or one of abnormal size.

In the past, complaints had been mostly on the true neps, which sometimes showed as light specks on dyed goods. More recently, dark-dyeing specks, sometimes apparently thought to be neps, have caused concern. These were not neps, but have consisted almost entirely of fuzz fibers. In general, fabrics containing them were found to contain a good many neps also, although they were hardly visible because they had been well covered by mercerization and dyeing, particularly with vat dyes.

The trend in fabrics examined was away from complaints on neps, toward complaints on fibers from fragments of seed-coat, or still on them. The question remains, whether this is evidence of a change associated with new ways of handling cotton, or the use of more favorable procedures in finishing plants, or both. The possibility of avoiding much of the trouble from neps in dyed goods is indicated.

LITERATURE CITED

(1) ASTM Standards on Textile Materials, D 1446—59T, American Society for Testing Materials, Philadelphia, 1959.
(2) Bogdan, J F, *Textile Inds 114*, No. 1, 98 (1950).
(3) Fargher, R G, Taylor, H M, and Thomas, F W, *J Textile Inst 41*, P590-608 (1950).
(4) Furvic, N-B, *J Soc Dyers & Col 74*, 299-303 (1958).
(5) Goldthwait, C F, and Smith, H O, *Textile World 100*, No. 9, 127 (1950).
(6) Goldthwait, C F, Smith, H O, and Barnett, M P, *ibid 97*, No. 7, 105 (1947).
(7) Lord, E, *Empire Cotton Growing Rev 25*, 3 (1948).
(8) Pearson, N L, USDA Tech Bull No. 396 (1933).
(9) Schenkel, E, *Textil-Praxis 12*, 631-50 (1957).

APPENDIX

DIFFERENTIAL DYEING PROCEDURES———The original differential dyeing method (*6*) can be employed to show immature fibers in cotton, including neps in cotton cloth. The dyeing is made with 1.2% on the cotton of CI Direct Red 81 and 2.8% of CI Direct Green 26 in a 1:40 bath at the boil. First, the dyeing proceeds for 15 minutes without added salt; continues for another 15 minutes after the addition of 2½% of salt; and for a final 15 minutes with a second addition of 2½% of salt, to the total dyeing time of 45 minutes. After rinsing in cold water and squeezing or hydro-extracting to remove excess cold water, the dyed cotton is dipped for 30 seconds into 50 times its weight of boiling water as a partial stripping to improve color contrast and rinsed in cold water. Cloth is preferably allowed to dry in the open air. Cloth colored in this way or with twice the amount of salt to get slightly darker dyeings shows neps as pronounced green or light green specks against a reddish gray background. If the cloth has been bleached the overall color is usually less red.

A rather different procedure has recently been used which was devised to get more red or green into cross sections of differentially dyed fibers. It was used also on some of the cloth because it gave more pronounced colors. The cotton is first dyed with 2% of the red with 80% sodium sulfate (anhydrous) at the boil for five minutes in a 1:40 bath. Then 3% of the green is added and dyeing continued for 35 minutes more. The dyed cotton is rinsed cold and given the same kind of partial stripping as before, for 30 seconds in boiling water.

The procedure has been employed at times with other changes to meet special requirements, but with no particular relative difference in results. Cloth is difficult to dye level in an open bath with this dye combination so when there have been sufficient amounts it has been differentially dyed and stripped on a narrow jug, with the method adjusted to the kind and amount of cloth to be dyed. Results have been excellent. To insure comparable results with heavier fabric samples dyed in an open kettle, the stripping has sometimes been changed to two minutes at 85°C to allow more uniform access of hot water to the cloth.

ADR ABSTRACTS

New Developments in Polyvinyl Alcohol Fibers

Wells, R D and Morgan, H M, *Textile Research J 30*, 668-74, Sept, 1960

"Vinal" (FTC generic name for polyvinyl alcohol fibers) has gained considerable commercial success abroad, in a variety of important applications and in competition with most fiber types with which it would contend in the United States.

One may ask why vinal has not appeared on the American textile scene before now. Actually, the authors state, plans for an American PVA fiber plant are now nearing completion.

Where does vinal fit into the ranks of fiber types? The authors point out that there are two trends in present fiber development. On the one hand an effort is being made to improve the natural and cellulosic fibers by decreasing the moisture sensitivity, adding strength or resilience, or increasing the resistance to chemical and microbiological degradation. On the other hand there is a trend to diversify the synthetic fibers into forms more adaptable to textile processing and fabrication.

From the standpoint of these efforts to "toughen up" the more fragile fibers and to "tame down" the more rugged ones, there appears to be a place for vinal. It can match tenacity with the best fibers, and yet has the moisture capacity and softness needed for full comfort in wearing apparel.

Vinal has the chemical and rot resistance one expects of the synthetics, yet adapts to processing, dyeing, coating and compounding with a facility quite unlike the "stubborn inertness" of the more common synthetics, the authors say. In discussing these properties, they point out that the term "vinal" encompasses a growing family of rather distinct subtypes, derived through several fiber-forming procedures and diversifiable by a number of modifying techniques. Two of these subtypes are referred to as Vinal 5F and Vinal FO.

Vinal 5F is made by a system which roughly follows rayon technology, with sequential stages of coagulation, drawing, heat treatment and formalization to develop and harden the fiber structure. This fiber, with certain chemical modifications, has been the main commercial vinal type so far. It has found applications in about every product where cotton has been traditional but where modern use and economic requirements dictated a major upgrading of performance levels in strength, abrasion resistance, and chemical and rot resistance.

Vinyl 5F is definitely a high-strength fiber; the

(continued on page 64)

A NEW GERM PROTECTION FOR THE FAMILY HEALTH

"DBH"

an effective weapon against

BACTERIA • FUNGUS • MOLD • ODOR

— remains bacteriostatic after many repeated launderings

— NO COLOR CHANGE • NON-TOXIC • ODORLESS • SAFE

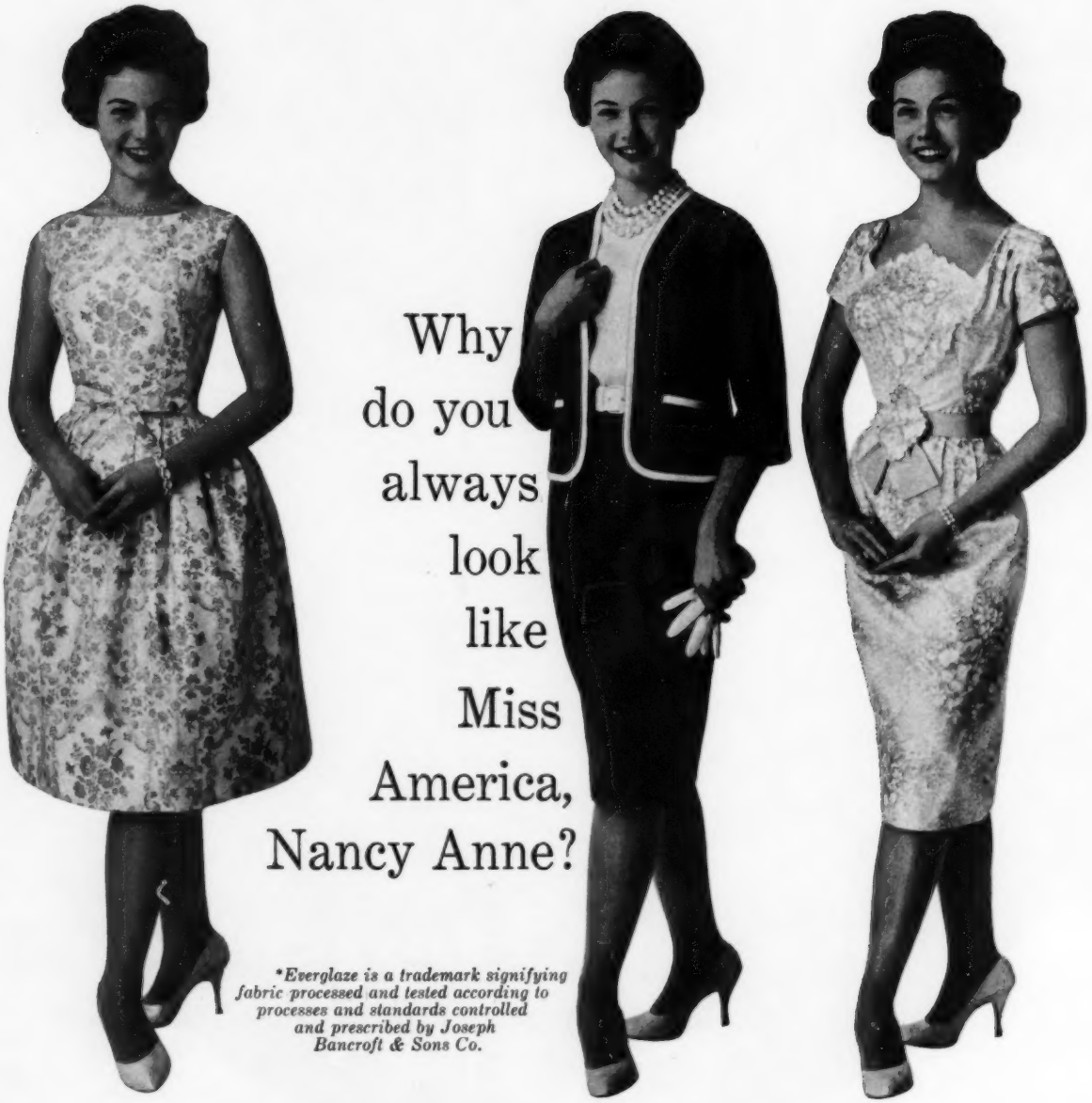
— compatible with Resins • Non-ionics and Cationics

— tested and confirmed by independent Bacteriological Labs.

CHEMICAL PRODUCTS CORPORATION

Manufacturing Chemists

WEST PATERSON • NEW JERSEY • OFFICES AND WAREHOUSES • CHARLOTTE • NORTH CAROLINA



Why do you always look like Miss America, Nancy Anne?

**Everglaze is a trademark signifying fabric processed and tested according to processes and standards controlled and prescribed by Joseph Bancroft & Sons Co.*

One reason is the Rohm & Haas RHONITE® resin in these attractive *Everglaze fashions. RHONITE penetrates inside the textile fibers, reacts there to create crease-resistant crispness that stays fresh through hours of wear and repeated launderings.

The easy-care, wrinkle-resistance of RHONITE is perfect for Nancy Anne. People expect her to look like Miss America always, everywhere she goes, because she *is* Miss America 1961, Miss Nancy Anne Fleming.

Get technical information on RHONITE resins for wash-wear finishes, calendered effects, textured, and stabilized cotton, rayon, and blended fabrics by contacting your Rohm & Haas representative.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHONITE

ADR News Report:

General News of the Industry
Personalities in the News
New Products, Developments, Processes

FMC Name Change

Food Machinery and Chemical Corporation changed its name to *FMC Corporation* on July 1. A management proposal to make the name change received stockholder approval at the company's annual meeting held May 23 at FMC's executive offices in San Jose, Calif.

FMC chairman Paul L Davies said that the company, as one of the most broadly diversified producers of industrial and agricultural machinery, basic chemicals, and defense materiel, had outgrown its name.

James M Hait, FMC president, explained that beginning on July 1, the physical changeover to the new name would proceed gradually throughout the balance of the year, so that FMC's various operations in this country and abroad can make the transition in an orderly fashion. In this way, FMC expects to be fully "in business" with the new name by January 1.

Mr Hait also reported that on July 3, the company's ticker symbol on the New York Stock Exchange was changed from "FDM" to "FMC".

•

Penick & Ford, Morningstar-Paisley to Merge

Penick & Ford, Ltd, Inc and Morningstar-Paisley, Inc have announced that their boards of directors have approved a plan for the merging of the businesses of their two companies. Under the terms of the proposed plan, the common stock holders of Morningstar-Paisley would receive .385 of of a share of Penick & Ford common stock for each share of Morningstar-Paisley. The plan is subject to the approval of the stock holders of Morningstar-Paisley, and a special meeting is expected to be called for this purpose. Upon consummation, Morningstar-Paisley, Inc will operate in its particular fields as a division of Penick & Ford, Ltd, Inc under existing management.

Penick & Ford, Ltd is a major corn refiner producing starches, syrups, dextrines, oils and fats. Sales for the year ended December 31, 1960 were $55,525,038 and net profits after taxes were $4,737,611 or $3.23 per share on 1,468,000 shares outstanding at the year's end.

The business of Morningstar-Paisley, Inc offers Penick & Ford the opportunity to expand into new lines of operation, particularly into the potato starch and chemical fields. The business of Morningstar-Paisley, Inc includes potato starches and dextrines, water-soluble gums and liquid industrial adhesives, synthetic resins for the paper industry as well as polyvinyl acetate emulsions. Sales for the year ended December 31, 1960 were $25,480,011 and new profit after taxes was $583,882 for 510,534 shares of common stock outstanding at the year's end.

•

Soiling of Chemically Treated Cotton to Be Studied by HRL

More information about the soiling of cotton fabrics, and ways to remove the soil more easily and thoroughly, will be sought by the Harris Research Laboratories, Inc, Washington, DC, under a contract with the U S Department of Agriculture.

The contract was negotiated by the Southern Utilization Research and Development Division, New Orleans, La, for the Department. George L Drake Jr, of the Cotton Finishes Laboratory, will supervise the work as Division representative. Henry Peper is project leader for the work at Harris Laboratories.

The studies reportedly will be directed toward establishing the relationship between physical-chemical surface properties and the soiling characteristics of cottons treated with selected finishing agents. Various types of coatings, including latex, silicone, and fluorocarbon compounds, will be included in the investigations. It is hoped that the information developed can be used as a further basis for the formulation of specific finishing agents designed to improve the soil resistance of cotton, and to facilitate the removal of soil.

Wachter Establishes Textile Engineering and Consulting Service

A textile engineering and consulting service, specializing in dyeing, finishing, printing, converting, fabric supply and chemical fields, has been established in the Pacific Coast area by Arthur R Wachter, former head of converting relations for American Viscose Corporation. The service strives to determine the nature and cause of fabric difficulties and dissatisfaction, and make recommendations for the amicable and just settlement of claims. In addition it attemps to aid in solving technical problems of fabric characteristics and production techniques which confront the aircraft and automotive industries, as well as the problems of locating worthy sources and adequate supply. Address inquiries to PO Box 75-133, Sanford Station, Los Angeles, Calif.

Mr Wachter has for twenty years been directing head of fabric quality-control operations for American Viscose Corporation, covering both trade and consumer relations, and including selling, merchandising, and advertising. A trained chemist with long practical experience in the application of dyestuffs and auxiliary chemicals to textile piece goods, Mr Wachter has been a pioneer in the successful application of vat dyestuffs, on a commercial plane, to rayons. He is an operating executive with a broad background in plant management and operating methods, and was named "Textile Man of the Year" (1951) Worth St Forecast; Samuel Salvage Award (1945). He is author of fabric quality standards adopted and now maintained as "ASA L22" for industrywide use, by American Standards Association.

•

TRI Denied Local Tax Exemption

On June 30, the Supreme Court of New Jersey affirmed a decision of the lower courts denying Textile Research Institute tax exemption from taxes assessed by Princeton Township for the year 1957 on land, improvements and personal property owned and used by the Institute. The Institute had appealed to the Appellate Division of the New Jersey Superior Court, but before argument there the Supreme Court certified the cause on its own motion.

The New Jersey Legislature has exempted from local property taxation buildings of New Jersey nonprofit corporations which are "actually used for colleges, schools, academies or seminaries." The sole issue for determination was whether the Textile Research Institute is a "college" within the meaning of the covering statute.

The court found that the word "college" does not embrace an organization which is controlled by a particular profit-making segment of society and which is devoted principally and primarily to research for the benefit of that industry. The power of member companies to elect the board of trustees and to vote at business meetings, and company participation in various advisory committees, result in control of policy and programming of the Textile Research Institute. The company members' privilege to consult with the Institute staff, their participation in group-supported special projects, the sponsorship of special projects by individual companies and their receipt of advanced and special information therefrom, their sponsorship of participating fellowships, their participation in Institute seminars and meetings, etc, lead to the conclusion that the Institute is primarily designed to benefit the textile industry, and is not an institution of learning as traditionally understood, and therefore is not a "college" within the meaning of NJSA 54:4-3.6.

A spokesman for the Institute reports " . . . at the moment TRI has no plans for pursuing this matter further. The Institute has continued to pay local property taxes and this adverse decision will not necessitate the payment of any back taxes nor will it introduce a new operating expense. We regret very much that the Court did not recognize TRI as a "college" within the meaning of the statute, but we are gratified that the court found against us solely on the grounds that the Institute is operated principally and primarily for the benefit of the textile industry."

New Process for Shrinkproofing Wool Fabrics

A new process for shrinkproofing wool fabrics was unveiled this month by the Wool and Mohair Laboratories, a research division of the United States Department of Agriculture.

At a conference arranged by Woolens and Worsteds of America, William L Wasley, head of fiber chemistry investigation at Albany, Calif, said the new process involved the application of a permanent plastic "skin" to the wool fiber, thus enabling the finished fabric to be machine washed "without appreciable shrinkage."

The conference represented the opening phase of a continuous program of providing information on the new shrinkproofing process to the industry and consumers by the USDA in cooperation with Woolens and Worsteds of America.

Studies of a variety of all-wool garments treated with the process, called "interfacial polymerization," are said to have revealed that these garments showed little or no shrinkage after being subjected to repeated home-style launderings. Conversely, untreated garments undergoing the same amount of laundering are said to have shown a great deal of shrinkage.

The pill resistance in a treated sweater fabric also was increased, said Dr Wasley. He added that sponging of the fabric following treatment may not be necessary. This factor, it was emphasized, would be a potential saving to manufacturers that would probably offset the additional costs of the processing.

Other advantages cited were that fabrics could be dyed after treatment and the treated fabric dried much smoother, although it was pointed out that ironing would improve the finished appearance.

The process of joining together two certain chemicals which, like oil and water, do not mix but rather form a membrane-like skin in the layer between the two solutions, called the "interface," was regarded as nothing but a laboratory curiosity until a few years ago, Wr Wasley said. At that time, it occured to the laboratories that this particular reaction could be of use in treating wool fabrics.

Subsequent experiments led to the discovery that a permanent polymer skin could be formed on each wool fiber by passing a woolen fabric through first one solution and then a second.

●

Alco Production Up as Result of Research Program

The results of an intensive five-year research program directed toward the development of new thickeners from a broad list of monomers, as well as to the finding of new uses for existing ones, has resulted in a direct expansion of production at Alco Oil & Chemical Corp. Reports from Alco president, Frank D Andruss, indicated that Alcogums now represent 15% of Alco's total production.

Alcogums are viscosifiers used in thickening latex. They are said to stabilize as well as thicken.

Recently, Alco prepared a pamphlet which explains the hows and whys of the complex techniques of thickening latex. Discussed in the booklet are such things as "Stabilizing Pigment & Filler Slurries", "Loading and Viscosity", "Compounding Temperatures", "Mixing", "Trapped Air" and "How To Compare Thickeners'. A copy of the booklet may be secured by written request to: "Thickening Latex", Alco Oil & Chemical Corp, Trenton Ave & William St, Philadelphia 34, Pa.

●

DMRC Expansion Program Announced

An expansion program located on the grounds of Deering Milliken Research Corp, Spartanburg, SC, which is said to be the most comprehensive privately financed textile research organization in the world, was announced earlier this month.

Roger Milliken, president of Deering Milliken, stated that work would commence immediately on an addition to the existing chemical research facilities. He further stated that construction would also start at once on an entirely new cotton processing and spinning research facility. The processing and spinning research operation is to follow plans developed jointly by Deering Milliken Research and the membership of the Institute of Textile Technology at Charlottesville, Va.

Koppers, Courtaulds Exploring Areas of Mutual Interest

Koppers Co, Inc and Courtaulds, Ltd, a leading English textile fibers and chemical concern, have announced completion of a first step in plans for the exploration of areas of mutual interest. Over the past few months Courtaulds has acquired an interest in the common stock of Koppers.

At its Board Meeting in Pittsburgh last month, Koppers elected J Albert Woods, chairman of the board of Courtaulds North America Inc, and Arthur W Knight, a director of Courtaulds, Ltd of London, to the Koppers Co, Inc, board.

Questioned as to the reasons for the investment, Mr Woods stated that for some time Courtaulds North America has been considering investing some of its available funds in the chemical and plastics industry in the United States.

In addition, both chairmen reported that discussions carried on over a period of several months indicated a number of the fields where technical, process or production know-how might be exchanged to mutual advantage by the two companies.

In addition to an opportunity for the direct flow of know-how between the companies in the United Kingdom and North America, both companies will evaluate opportunities for joint collaboration in other areas of the Free World. It was pointed out that Koppers has been particularly active in North and South America, while Courtaulds has many operations and partnerships in Europe, Africa and Australia.

Courtaulds is presently an active factor in the viscose fiber field in North America through Courtaulds (Alabama) Inc and Courtaulds (Canada) Ltd, which presently supply part of the American rayon market. It was stated that there is no intention at the present time to merge these fiber operations with Koppers, or to carry on any future expansion in the fiber field through Koppers.

Asked how much stock was involved and how it was acquired, the chairmen would only say that in excess of 100,000 shares, representing between four and five percent of Koppers outstanding common stock, is now held by Courtaulds, and that the bulk of it was acquired in the market, supplemented by the issue of stock by Koppers.

Courtaulds is now one of the largest British industrial companies with net tangible assets of $546 million. In 1960 about 70% of these assets and 60% of profits were attributable to textiles, particularly man-made fibers which Courtaulds pioneered throughout the world. It is still the world's largest fiber producer despite the sale in 1941 of its holding of 95% of the common stock of the American Viscose Corporation. Courtaulds is also a large producer of chemicals.

Koppers is a highly diversified company with more than 100 major groups of products and services. About half of its sales are in chemical and tar processing.

●

Proctor Chemical to Expand Facilities

Proctor Chemical Co, Salisbury, NC, has begun a $250,000 expansion program to enable the firm to process new products developed locally for the textile and chemical industries.

The brick and block addition will be 60 x 200 feet and linked with the old building. It is planned as the first of three possible additions. The structure reportedly will be 24 feet in height—tall enough to house the reactors required to process the new products. General manager E Murphy said the expansion is the first step toward diversification of the Company.

Proctor research, headed by Warren Beaumont, developed AEH (anhydroaneaheptitol), from which a series of thermosetting resins that is said to have little or no effect on the lightfastness of fiber-reactant dyestuffs was developed. AEH is a reactive chemical which will form the basis for many additional new compounds.

●

Commerce Secretary Breaks Ground for New NBS Laboratories

On June 14, Secretary of Commerce Luther H Hodges broke ground for the new National Bureau of Standards Laboratories at Gaithersburg, Md. The ceremony signaled the initial construction phase for a 20-building, $104 million research facility which will permit complete relocation of the Bureau from Northwest Washington to the 555-acre site in Montgomery County.

Butterworth Expands Machinery Research and Development

H W Butterworth & Sons Company, Bethayres, Pa, has announced an accelerated program of research and development in the fields of new machinery for the textile finishing and plastics industry.

Butterworth, a division of Van Norman Industries, Inc, has indicated that its current research program includes an emphasis on new methods of dyeing, bleaching and washing of woven fabrics and new plastic film ranges. The program also includes adapting many foreign patents for use in the American market. During 1961-62, the firm reportedly will invest a total of about $200,000 in research and development of new processes and equipment.

Among standard products in the Butterworth line are 84 diversified machines for such functions as dyeing, bleaching, drying and finishing for the textile industry, and spinning and processing machines for the makers of synthetic fibers.

Research, manufacturing and development facilities at the Butterworth plant also have been greatly expanded.

•

Philadelphia Quartz Company—130 Years Old

Just a few years before the start of the Civil War, the Philadelphia firm of Joseph Elkton & Son, later to be known as the Philadelphia Quartz Co, began experimenting with sodium silicate. Since the founding of the firm in July 1831, soap and candles had been its only products, but news from abroad that sodium silicate had value at a detergent builder for soap was intriguing. Experimental work proved that it was very beneficial to the qualities of Elkinton's soap products and before long other soap makers wanted to buy silicate.

A business within a business was developing and the company made its first recorded sale of sodium silicate 100 years ago on January 21, 1861. The Civil War, which broke out three months later, resulted in embargoes preventing Northern soap producers from procuring Southern rosin, an important ingredient in kitchen and laundry soaps. Silicate as a soap builder consequently came into greater demand and was recognized as an improvement over rosin. Although soap making continued at the original Elkton plant on South Second Street, Philadelphia, it became necessary to expand production for the manufacture of silicate. In 1864 a larger factory was built at Ninth and Mifflin Streets, and it was then that the name of Philadelphia Quartz Company first appeared.

By the time the nation celebrated its centennial, the company had added a technical representative who could demonstrate how silicate was used in soap. Calling upon a manufacturer, he produced from his satchel, miniature soap-making equipment and proceeded to make a small batch of soap in the buyer's presence. Thus, the method to establish proof of the value of silicates, not only in washing, but in other industrial processes, was instituted.

An array of silicate products was now offered, indicating new uses for what was becoming recognized as a versatile chemical. In 1889, growing business in the mid-west justified the opening of a silicate factory at Anderson, Indiana. In 1905 the outdated Philadelphia plant was replaced by a new factory at Chester, Pa, to meet increasing sales demands. It was then decided to concentrate the entire energies of the company on the manufacture and development of silicates.

Today, soluble silicates are used in a wide variety of industries. Currently, the company's literature on soluble silicates covers over 100 different subjects. *Silicate P's and Q's*, the monthly house organ, is dedicated to disseminating information on silicates. It has been published continuously for over 40 years.

The nine Philadelphia Quartz Company plants are located at Anderson, Ind; Baltimore, Md; Buffalo, NY; Chester, Pa; Jeffersonville, Ind; Kansas City, Kas; Rahway, NJ; St Louis, Mo; and Utica, Ill. Associated companies operate on the Pacific Coast and in Canada.

Thomas W Elkinton, chairman, is a great-grandson of the founder; his son, Thomas, is president of the firm. Other directors of the company are: William Martin, James A Norton, Chester L Baker, John C Russell, Charles E Ramsey, J Morris Evans, Monroe J Blanchard. General offices are located in the Public Ledger Building, Philadelphia 6, Pa.

New Sodium Silicate Plant in Southeast

Chemical Products Corp has started construction of a new plant at Cartersville, Ga, for the manufacture of a line of sodium silicates. Initial production reportedly will include most of the commonly used solution grades, one anhydrous glass and sodium metasilicate pentahydrate. Completion of the plant is expected by mid-October 1961 with full-scale production following shortly thereafter.

The new plant is being build adjacent to the company's existing barium chemicals facility at Cartersville. It reportedly will be the first basic sodium silicate operation in the southeast.

•

AviSun's Polypropylene Plant Begins Equipment Testing

The AviSun Corp's new 100-million-pound-per-year polypropylene plant has begun initial equipment testing. Dedication ceremonies will be held in September.

Located on a 214-acre site in New Castle, Del, the multimillion dollar plant reportedly will make AviSun the largest polypropylene producer in the world. The firm is said to be currently producing 25 million pounds of resin annually at facilities at Port Reading, NJ. Shipments from the new plant will begin in September when all components are expected to be operating.

AviSun, established in 1959 as an equally owned affiliate of American Viscose Corporation and the Sun Oil Company, is said to be the first fully integrated producer of the new thermoplastic material. The company's film manufacturing facilities and fiber pilot plant are adjacent to the new resin plant at the New Castle site.

Research and technical service laboratories are maintained at Marcus Hook, Pa, with corporate headquarters located in Philadelphia.

The company is carrying on an extensive pilot-plant program with polypropylene fiber. The new plant will provide raw materials for the film and fiber operations.

Propylene for the plant will be supplied by Sun Oil's Marcus Hook refinery, about 20 miles upriver from New Castle. Manufacturing and research facilities of the American Viscose Corporation are also located at Marcus Hook.

Heading operations at the new AviSun plant will be Nicholas E Carr, director of manufacturing; Richard M Zielinski, plant manager; Harry W Nagel, operations superintendent; Richard C Rhodes Jr, maintenance superintendent; William C Northington, chief chemist; and Charles M Hamilton Jr, chief process engineer.

•

NCC Hails Nonresin Finishes

New nonresin finishes that are said to greatly improve the "easy-care" characteristics of cotton fabrics are being hailed by the National Cotton Council as an important scientific achievement.

According to the Council's utilization research division, the finishes are finding extensive application in high-quality fabrics for men's "wash-and-wear" dress shirts. A big advantage claimed for them is their ability to hold up even to repeated severe commercial launderings.

Improve wet wrinkle recovery and good dry crease resistance are important characteristics of the new treatments. Both properties are important—the former for optimum "wash-and-wear" performance; the latter for good tumble-dry appearance and freedom from wrinkling during wear.

Another claimed advantage is good bleachability without chlorine retention, strength loss, or yellowing. Fabrics also are said to be free from chemical odors.

Treatments are based on several different kinds of chemicals. Among these are formaldehyde, and epichlorohydrin and divinyl sulfone derivatives. Effectiveness of the finishes is basically the result of their ability to react chemically with the cotton fiber—to cross link the cellulose molecules and thereby improve fiber resilience.

* * *

The National Cotton Council has announced dates for its annual chemical finishing conferences. The 1961 conference will be held in Washington, DC, November 8-9.

The conferences are scheduled to be held in Washington through 1965. Dates are as follows: October 3-4, 1962; October 1-2, 1963; October 6-7, 1964; September 28-29, 1965. Names of hotels at which the conferences will be held will be released at a later date.

PERSONALITIES IN THE NEWS

Simon Askin, president, chief executive officer and directod of Heyden Newport Chemical Corp, has been elected president of the Armed Forces Chemical Association. Mr Askin was elected for a two-year term. He succeeds *Wendell F Jackson* of E I duPont de Nemours & Company's Research Division.

Mr Askin has had more than eighteen years experience with Heyden Newport. He was elected president of Heyden in 1952.

Mr Askin has been a charter member of AFCA since its inception. He was president of the association's New York chapter in 1954-56, and subsequently a director and director-at-large.

The Armed Forces Chemical Association was formed in 1945 and is a national organization "dedicated to scientific and industrial preparedness for the common defense in the fields of chemical, biological, radiological and related technology." National headquarters is in Washington, DC, at 408-410 Park Lane Building, 2025 Eye Street, NW.

●

Leslie L Walmsley of American Viscose Corporation has been assigned technical service responsibilities to the dyeing and finishing trade. In his new post, Mr Walmsley will work closely with the Dyeing and Finishing Division headed by *Irvin Welch*, carrying on much of the work formerly handled by *Arthur R Wachter*, who retired June 30. Mr Walmsley will maintain his headquarters at Marcus Hook.

During the past eighteen years, Mr Walmsley has been a staff member of the Technical Service Department, part of this time serving as head of the Dyeing and Finishing Division. In this capacity, he did cooperative work on customer problems and developments on a dyeing and finishing level at customers' plants.

●

Rohm & Haas Co, Philadelphia, has announced the retirement of *Parker H Del Plaine*, southern manager of the Company's Textile Chemicals Department at Charlotte. He is succeeded by *W A Wardell*, who has been in the Charlotte office since 1939.

Mr Del Plaine was graduated from Lowell Textile Institute and joined Rohm & Haas in 1925. He worked in the company's laboratory at Bristol, Pa, before going to Charlotte in 1931.

Mr Wardell, who now take over the post of Southern Manager, worked for several years in weaving and finishing plants in the South before joining Rohm & Haas. He has been closely associated with Mr Del Plaine during the past twenty-two years, and has been assistant manager of the Charlotte office for the past several years.

●

George R Purdy has rejoined Onyx Chemical Corp, Jersey City, NJ, effective July 5.

Mr Purdy was previously associated with Onyx for 26 years, leaving in 1956 to form the Karasell Chemical Co. He has most recently been associated with the Refined Products Corporation.

Mr Purdy's duties will be as a technical sales representative for New York, New Jersey and eastern Pennsylvania.

●

Richard H Dillinger has been appointed manager of starch sales, a newly created position at Morningstar-Paisley, Inc, New York. Mr Dillinger will coordinate and be responsible for sales of bulk and modified tapioca and potato starch as well as promotion of ethylated, oxidized and cationic starch derivatives, dextrine products and pregelatinized starches.

Mr Dillinger was formerly assistant manager of the M-P Paper Department and is rounding out his 25th year in the starch industry.

●

Claude H Allard has been appointed director of marketing of the Naugatuck Chemical division, United States Rubber Co.

Mr Allard, who formerly was superintendent of chemical production at the division's main plant in Naugatuck, Conn, replaces *Harold M Parsekian*, who has resigned and is now associated with Masters Chemical Co, Toledo, O.

In his new post, Mr Allard will supervise all marketing operations for the division, which he joined in 1947.

Breidenbach

Meer

Fullerton

R W (Dick) Breidenbach has joined Turbo Machine Co, Lansdale, Pa, as a sales engineer, covering mainly southern hosiery mills and finishing plants. Mr Breidenbach, formerly connected with Royersford Needle Works, Inc, will be principally concerned with sales of the Turbo dye boarder, and other Turbo dyeing and finishing equipment.

●

Ellis Meer, president of Meer Corp, North Bergen, NJ, has been elected president of the Water-Soluble Gum Association.

Mr Meer, associated with the water-soluble gum industry since 1926, is considered a leading authority on the quality standards and application of these products, with special emphasis on gum tragacanth.

A member of the association for the past ten years, he has served as an executive officer for the past four. He has also been an important contributor to the association's quality-control standards.

The Water-Soluble Gum Association, established thirty years ago, regulates the quality specifications and sets standards for the sale of water-soluble gums which include gums tragacanth, arabic, karara, locust bean gum, agar agar and gums guar and ghatti. The association also sets the requirements concerned with importing and handling these products.

●

W J Fullerton has joined Hartford Fibres Company, division of Bigelow-Sanford, Inc as assistant to *C Chester Bassett Jr*, vice president of Bigelow-Sanford, Inc in charge of the Hartford division.

In the new post, Mr Fullerton will be in complete charge of all marketing, merchandising, sales promotion and advertising activities for Hartford's new Zantrel Polynosic fiber, reporting directly to Mr Bassett.

The appointment became effective July 5.

Assisting Mr Fullerton in these activities will be *Walter R Schrader*. *C D Reich* will continue his activities on Zantrel with converters and cutters in the New York market, also under Mr Fullerton's supervision.

Mr Fullerton joined Hartford Fibres from Waldburger & Co, New York, fine goods converters and importers, where he was executive vice president for three years.

●

Pap-Tex Color & Chemical Co, North Wilbraham, Mass, manufacturer of specialty formulations for the textile, paper and leather industries and distributor of dyestuff and heavy chemicals, has elected *Sol Markowitz* president and *Robert W Pattison* treasurer.

Mr Markowitz has been associated with the chemical industry for the past 15 years.

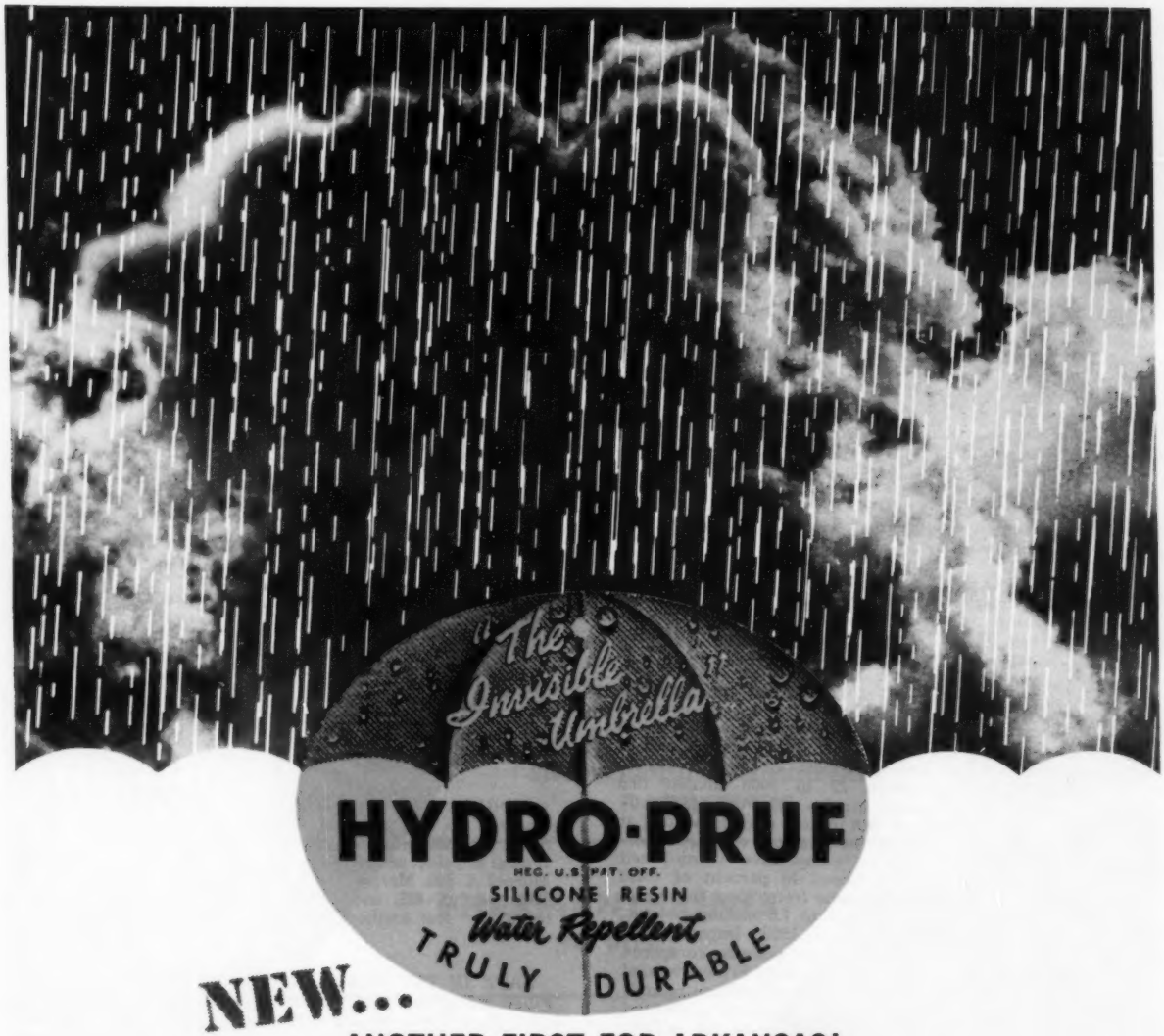
Mr Pattison, prior to joining Pap-Tex, was a consultant to the pulp and paper industry.

●

The retirement of *Abraham J Dankberg* and *John Milton Holmes*, each after more than 40 years of service with Bradford Dyeing Association, has been announced.

Mr Dankberg joined BDA in 1916 and rose from office boy in the company's New York office to sales representative, a position he held for the past 35 years.

Mr Holmes was chief engineer at the Bradford plant in Westerly, RI. He joined the parent company in Bradford, England 42 years ago where he served as plant engineer and section engineer until his final promotion to chief engineer. He came to the United States in 1954 as chief engineer of Bradford, USA.



NEW...

ANOTHER FIRST FOR ARKANSAS!

HYDRO-PRUF® C (for Cotton)

The most durable silicone water repellent ever produced for cotton—PLUS the finest hand ever achieved!

TRULY DURABLE—will withstand many washings at the boil in the presence of alkaline extenders

STABLE—will not break down on continuous operation—no spots or oily rolls when applied

COMPATIBLE—with most thermosetting resins and color fixatives

EASY TO USE—no extra operations required

NO SHADE CHANGE—even on naphthol dyed cottons

UPGRADE YOUR COTTON FABRICS WITH HYDRO-PRUF C!

Ask for our Technical Service Bulletin on Hydro-Pruf C—a notable achievement of Arkansas research.

ARKANSAS CO., INC.

NEWARK, NEW JERSEY

SERVING THE TEXTILE INDUSTRY FOR OVER 57 YEARS

TECHNICAL LITERATURE

(Literature is available from sources listed in italics)

AIRCO—ORGANIC CHEMICALS AND COLTON POLYMERS——*Air Reduction Chemical & Carbide Co, 150 East 42nd St, New York 17, NY*—This eight-page bulletin, issued by Air Reduction Chemical & Carbide Co, a division of Air Reduction Co, Inc, gives information on a large group of products, ranging from calcium carbide and pipeline actylene to organic compounds and special-purpose resins.

Also available are two abbreviated versions of the Airco bulletin, covering the product lines of two of the company's chemical marketing departments. A six-page bulletin entitled "Colton Polymers" lists the physical properties and applications of the products marketed by the Colton polymers department. Among the products included in the bulletin are Airco Vinol polyvinyl alcohols, Flexbond copolymers, Vinac polyvinyl acetates, Flexac polyvinyl acetates, and Aircoflex dibutyl phthalate.

"Airco Organic Chemicals" is a four-page bulletin covering Airco vinyl monomers, acetylenic alcohols and glycols, alkyl acetylenes, and Surfynol surface-active agents. These products are marketed by the organic chemicals department of Air Reduction Chemical & Carbide Co.

•

IMPORTS OF COAL-TAR PRODUCTS, 1960—*Secretary, U S Tariff Commission, Washington 25, DC*—Report on US imports of coal-tar products entered in 1960 under paragraphs 27 and 28 of the Tariff Act of 1930 provides detailed statistics on coal-tar intermediates entered under paragraph 27, and on coal-tar dyes, medicinals and pharmaceuticals, flavor and perfume materials, and other coal-tar products entered under paragraph 28. The data in the report were obtained by analyzing invoices covering general imports of coal-tar products into the United States during 1960.

The report shows that general imports of coal-tar chemicals entered under paragraph 27 in 1960 totaled 19.8 million pounds, with a foreign invoice value of $11.5 million, compared with imports of 28.8 million pounds, valued at $14.0 million, in 1959. Most of the coal-tar chemicals imported in 1960 were declared to be "competitive" (duty based on "American selling price"). About 40 percent of total imports of these products in 1960 came from West Germany; imports from that country amounted to 7.6 million pounds, compared with 10.8 million pounds in 1959. Imports from Canada in 1960 amounted to 2.5 million pounds, compared with 1.4 million pounds in 1959. Imports from France totaled 2.5 million pounds in 1960, compared with 2.7 million pounds in 1959, and imports from the United Kingdom amounted to 2.0 million pounds in 1960, compared with 2.4 million pounds in 1959. In 1960 sizeable quantities of products that are dutiable under paragraph 27 also were imported from Italy (1,287,000 pounds), Switzerland (1,135,000 pounds), Japan (876,000 pounds), and the Netherlands (610,000 pounds), Belgium (478,000 pounds), Denmark (220,000 pounds), Spain (364,000 pounds), and Sweden (95,000 pounds). Smaller quantities came from Austria (44,000 pounds) and Norway (11,000 pounds).

Imports in 1960 of all finished coal-tar products that are dutiable under paragraph 28 comprised 1,770 items, with a total weight of 12.3 million pounds and a foreign invoice value of $22.2 million. In 1959 imports consisted of 1,968 items, with a total weight of 11.3 million pounds and a foreign invoice value of $21.9 million. In 1960, as in 1958 and 1959, medicinals and pharmaceuticals were the most important group of imported finished coal-tar products. Imports of medicinals and pharmaceuticals in that year amounted to $10.4 million (foreign invoice value), or 47 percent of the total value of all imports under paragraph 28. In 1959 imports of medicinals and pharmaceuticals amounted to $10.7 million (foreign invoice value), or 49 percent of the total value of all imports under paragraph 28.

Imports of coar-tar dyes, the next most important group of products entered under paragraph 28 in 1960, were four percent smaller in that year than in 1959 and 17 percent larger than in 1958. In 1960 imports of dyes (excluding synthetic organic pigments) were valued at $7.6 million (foreign invoice value), or 34 percent of total imports under paragraph 28. In 1959 imports of dyes (excluding synthetic organic pigments) were valued at $7.9 million, or 36 percent of total imports under paragraph 28. In 1960 imports of synthetic organic pigments (toners and lakes) were valued at $561,000, compared with $401,000 in 1959. Imports of perfume and flavor materials in 1960 ($1,226,000) were 42 percent greater than in 1959. Imports in 1960 of other coal-tar products entered under paragraph 28 (chiefly synthetic resins) were valued at $2.5 million, or 19 percent more than in 1959.

•

ISOCHEM RESINS LINE——*Isochem Resins Co, 221 Oak St, Providence 9, RI*——Data sheet lists the standard resins manufactured by Isochem Resins Co of interest to epoxy resin users.

•

ONAMINE RO—*Onyx Chemical Corp, 190 Warren St, Jersey City 2, NJ*—Onyx has announced the publication of its revised bulletin on Onamine RO, strongly cationic cyclic tertiary amine.

It is reported that Onamine RO's powerful surface adsorption characteristics, exceptional stability in strong acids and in saturated brines, and excellent heat stability find application in the textile and other industries.

•

MORFLEX SPECIALTY PLASTICIZERS—*Chemical Sales Div, Chas Pfizer & Co, Inc, 235 East 42nd St, New York 17, NY*—Data Sheet No. 560 offers descriptive material, specifications, physical properties and typical performance in vinyl films for the following specialty plasticizers: Morflex 300, Morflex X-1118, Morflex X-1125, and Morflex X-1134. Information on test methods and packaging also is included.

•

MORPEL AND MORCOWET—*Chemical Sales Div, Chas Pfizer & Co, Inc, 235 East 42nd St, New York 17, NY*—Data Sheet No. 559 offers descriptive material, specifications, and typical physical properties for the following Pfizer sulfonates: Morpel X-803, Morpel X-914, Morcowet Z, Morcowet X-327, Morcowet X-469, and Morcowet X-862. Information pertaining to test methods and packaging also is included.

•

SAFE IN THE ARMS OF CAPROLAN SEAT BELTS—*Fiber Marketing Dept, Allied Chemical Corp, 261 Madison Ave, New York 16, NY*—"Seat belts are fun, as well as safety necessities for children" is the theme of this six-page booklet on automobile seat belts and children. Vital questions concerning the need, use and comfort of safety seat belts are discussed. Caprolan nylon, produced by Allied Chemical, is the fiber from which more than 70 percent of all nylon seat belts is produced, it is claimed.

Control of children in the family car through seat belts, the booklet points out, not only means safer driving but provides low-cost extra protection for their lives and well-being. Children like having their own seat belts in the family car, it adds, because they associate them with pilots, stunt drivers, state troopers and airline travelers.

•

X-LINK 2833—*Resin Div, National Starch and Chemical Corp, 750 Third Ave, New York 17, NY*—Six-page technical brochure describes the recently introduced self-reacting crosslinking resin latex, X-Link 2833. It is designed to give prospective industrial users general information and data on properties, formulation, and applications of this new vinyl-acrylic copolymer dispersion, which is said to be capable of crosslinking without the addition of thermosetting resins.

Unusual properties of X-Link 2833 in film strength and resistance to water, creep, and solvents which are said to offer application advantages over those of conventional thermoplastic resins are described, and formulation data on pigmentation and thickeners are given.

The brochure covers a number of application areas where use of the self-crosslinking latex shows promise including nonwoven fabrics and textile finishes. Typical latex and film properties of X-Link 2833 are also listed.

E.J.FEELEY COMPANY

E. J. Feeley Co.

DYESTUFFS · MANUFACTURERS OF TEXTILE CHEMICALS

263 SUMMER ST., BOSTON, MASS. · 1700 WALNUT ST., PHILADELPHIA, PA. · 650 STATE ST., CHARLOTTE, N. C.

Direct Selling Agents in the South of

BASES

STABLE SALTS
(STORED IN TEMPERATURE CONTROLLED VAULTS TO INSURE FRESHNESS)

PHARMANTHRENES
(VAT DYES)

PYRAZOLINES
(FAST DIRECT DYES)

DIPYRAZOS
(DEVELOPED DYES)

COLORS FOR WOOL

PHARMA

Manufactured by

PHARMA CHEMICAL CORPORATION

Plants:
BAYONNE • NEW JERSEY

Abstracts

(continued from page 54)

standard tenacity is 4.5-6.0 gpd, the abrasion resistance is at least twice that of cotton, and in weather resistance it is among the best fibers.

Vinal FO, the other subtype, is a highly crystalline form of pure polyvinyl alcohol. The filaments are hot-drawn and heat-treated after extrusion and are not formalized. The yarn has a tenacity of 7.2 gpd and a high modulus. It finds much use for tire cord.

The authors state in conclusion that perhaps the most intriguing aspect of the vinals is the versatility of the PVA system. It would seem possible to tailor-make a vinal type to meet about any reasonable specification, they say.

Eight references to the literature are cited.

●

Effects of Softeners on Thermoplastic Resins

Magnussen, F, *Can Textile J 78*, 37-40, May 12, 1961

The chief reasons for putting thermoplastic resins onto fabrics are to give increased stiffness and body. Unfortunately this is usually accompanied by a loss in draping properties and other physical characteristics. It is therefore common practice to add softeners in order to overcome these defects.

The author describes an investigation of the alteration in physical properties occurring on a 150-denier secondary acetate lining when finished with four different thermoplastic resins in combination with seven types of softeners.

The resins used were polyvinyl acetate, polyvinyl alcohol, a methyl acrylate resin and an alkali-soluble vinyl resin.

The softeners employed included a sulfated fatty ester, a fatty ester, a polyethylene emulsion, diethylene glycol, an ethylene oxide condensate, an alkyl imidazoline, and a fatty carbamide. It will be noted that of these seven softeners two are anionic, three are nonionic, and two are cationic.

The changes in fabric properties or physical characteristics were determined by the following test methods: sewing properties (number of cut filaments), stiffness, abrasion (using the Stoll Abrader), and tear strength (using the Instron Tensile Tester). The results of all these tests are presented in the form of bar charts.

From an examination of these charts, the best type of softener to use with polyvinyl acetate would appear to be the ethylene oxide condensate, particularly for its improvement of the sewing properties.

For polyvinyl alcohol, the best overall softeners were apparently ethylene oxide condensate and alkyl imidazoline.

For the methyl acrylate resin, again the ethylene oxide condensate seemed to be the best all-round softener.

For the vinyl resin, however, it is difficult to pick the best softening agent for all purposes. To improve stiffness, no softener was particularly effective. To improve sewing properties, the fatty ester gave best results. To reduce abrasion, the best was diethylene glycol, and for optimum tear strength, the ethylene oxide condensate.

The conclusion reached by the author from this investigation is that very different physical properties are obtained when different softeners are used with thermoplastic resins, and that it is quite possible to upgrade fabric performance by correct choice of resin and amount of softener while still retaining a satisfactory hand or feel in the fabric.

Important Factors in "Wash-and-Wear" Finishing Techniques

Dorset, B C M, *Textile Mfr 86*, 495-9, 503, Dec 1960

"Wash-and-wear" properties are not confined to any single type of fiber or fabric. In deciding the best treatments to use, many factors must be fully considered. In this article the author discusses recent research trends that point the way to new and improved methods of processing.

The excellent "wash-and-wear" characteristics of synthetic fiber goods are closely associated with the fact that synthetic fibers such as nylon and Terylene are strongly hydrophobic and swell little when wetted. One line of research in the development of "wash-and-wear" finishes for cellulose fiber goods thus lies in seeking treatments which will make such fibers less hydrophile and thus more inert towards water.

It is often assumed that crease-resist and "wash-and-wear" finishing processes are much the same thing. This is a mistake which recently has become much clearer; it is not satisfactory to apply the usual crease-resist finish and expect to obtain the most suitable "wash-and-wear" finish. There are definite reasons for this.

Hitherto, crease-resist finishing has been mainly considered from the viewpoint of *dry* creasing. But for a fabric to have satisfactory "wash-and-wear" characteristics it should be resistant to both *dry* and *wet* creasing.

It has been found that wet creases can persist through the drying process. For example, if creaseproofed cotton fabric is washed in the usual way, and at this stage is substantially free from creases, it can, when freed from excess of water by spin-drying, become so definitely creased in this operation that when the fabric is shaken out and dried in open width many of the creases remain.

To obtain maximum wet crease resistance in addition to dry crease resistance, modification of the process is necessary. This may involve either the resin composition used, or the use of entirely new products, or a special treatment of the cellulose fiber material to enable it to be more responsive to the resin treatment applied. Recent researches have been largely directed along these lines and have secured considerable success, the author says.

Several research papers on this subject which have appeared recently are discussed by the author. These deal with the action of formaldehyde on cotton in the presence of water; the application of epoxy resins to cotton fabrics for "wash-and-wear" purposes (three papers); and the risk of liberation of formaldehyde odor from resin-treated goods in storage.

●

Polypropylene Textile Fibers

Hooper, G S, *Textile Bull 87*, 60-1, May, 1961

Prolene (Hercules Powder Co's name for polypropylene fiber) is produced by the melt-spinning process and is highly oriented. The tenacity ranges from 5.5 to 7 gpd. The fiber has high abrasion resistance, and has the advantage over most of the other synthetics in possessing a very low density (only 0.9 sp gr).

The fiber is chemically inert and very resistant to most acids and alkalis, even at elevated temperatures. However, some aromatic and chlorinated solvents and vegetable and mineral oils can cause swelling. Normal drycleaning solvents do not harm it. The melting point is around 335°F, and the fiber becomes sticky at 311°F.

Blends of Prolene with wool or cotton in a 65/35

ratio are said to have a very high crease resistance.

Dyeing of polypropylene fibers presents a problem because they are lighter than water. Some success has been attained in producing light and medium shades with selected dyes of various classes, but the fastness is only moderate. However, the fiber can be colored by incorporation of colored pigments in the melt prior to spinning ("solution dyeing"), but only those pigments may be used which will withstand the tremendous heat necessary to melt the material.

One of the most promising fields for the polypropylene fiber is in the making of carpets. Its high strength, abrasion resistance and nonabsorption of moisture make it ideal for this purpose, the author says. A 100% Prolene carpet is said to be almost indestructible so far as wear is concerned.

Other uses for the fiber are in ropes, cordage, netting, upholstery, various industrial fabrics and work clothing.

•

Fiber Modification by Irradiation and Polymer Grafting

Hall, A J, *Textile Recorder 78*, 57-9, 67, May, 1961

In recent years, as a result of outstanding advances in electrical science, it has become possible to make use of "ionizing radiation" for modifying the properties of a wide range of substances, particularly polymers both natural and synthetic, thus increasing their usefulness. More recently, in this same field, attention has been given to textile fibers.

The term "ionizing radiation" includes two types: particle radiation (eg, of alpha and beta rays, neutrons, etc) and electromagnetic radiation (x-rays and gamma rays).

Irradiation can also be employed to assist the grafting of polymerizable substances (unsaturated compounds such as acrylic and methacrylic derivatives are included among these) on to fibers, and thus produce useful modification.

In the irradiation of textile fibers or fabrics, essentially the result will depend on whether or not there are present on or in the fibers other substances which the energy of radiation can cause to combine with the fibers. If no such substance is present, changes will be produced in the fiber substance.

Cotton which has been suitably irradiated is said to undergo oxidation and acquire base-exchange properties; ie, it combines with calcium, magnesium, etc, in hard water, similar to base-exchange resins.

Irradiation of wool gives it increased affinity for certain acid dyes. By exposing a wool fabric to ultraviolet light according to a pattern and then dyeing it, light and dark effects are produced.

Polyester fibers (eg, Dacron) when irradiated with gamma rays undergo cross-linking, and the modulus of elasticity is increased.

The dyeing properties of acrylic fibers and copolymers containing at least 80% acrylonitrile can be improved by incorporating in them, while in the wet stretched condition, certain poly-N-vinyl lactams. While the fibers are still wet they are exposed to a high-energy x-ray radiation beam. These irradiated fibers have strong affinity for direct dyes, it is said.

By irradiation wool fabric can be caused to graft-polymerize or otherwise chemically combine with polyethylene glycol to become antistatic and to resist the formation of pills during wear, according to the author. Silk and acetate can also be made antistatic, and rubber thread has improved resistance to oils, when suitably graft-copolymerized.

It is already evident that by irradiation treatment most types of textile fibers can have their physical and chemical properties profoundly modified.

FIRST
from BALTIMORE

BENJAMIN HENFREY, of Baltimore, lighted the FIRST room in the United States with GAS in 1802.

Also lighted a street corner, in Baltimore, with gas...the FIRST PUBLIC STREET thus lighted in this country.

The GAS LIGHT COMPANY of BALTIMORE, founded in 1816, was FIRST Company in the United States organized to manufacture gas for street lighting and general use.

AND ALSO FROM BALTIMORE...

YOUR FIRST CHOICE IN BLACKS

- DIRECT
- ACID
- DEVELOPED
- ACETATE
- FORMALDEHYDE
- LOGWOOD

THE HOUSE OF BLACKS

Consult your local dyestuff distributors for information and samples. Shipments can be made from our Baltimore factory.

Courtesy – The Baltimore News-Post

YOUNG ANILINE WORKS, INC.

OFFICE AND FACTORY: 2701-2733 BOSTON STREET • BALTIMORE 24, MARYLAND

PENETRANTS • DETERGENTS • SOFTENERS • REPELLENTS • FINISHES

BURK-SCHIER

BURKART-SCHIER CHEMICAL CO., CHATTANOOGA, TENN.

CLASSIFIED ADVERTISEMENTS

Advertisements in this section are restricted to HELP WANTED — POSITION WANTED — EQUIPMENT wanted or for sale. Rates, effective February 1, 1951; one-time, $14.00 per column inch; 13 or more times, $12.00 per column inch; Position Wanted, $4.00 per column inch. Figure 38 average words per column inch. Publisher reserves the right to reject or discontinue any classified advertisement. Replies should be addressed: Box Number ..... c/o American Dyestuff Reporter, 44 East 23rd Street, New York 10, N. Y.

• SERVICES •

ABSTRACTING SERVICES—Abstracting and digesting of foreign patents and periodicals. Literature review and special reports in dyestuff and cellulose chemistry. PAUL WENGRAF, 88-36 ELMHURST AVENUE, ELMHURST 73, NEW YORK.

• OPPORTUNITIES AVAILABLE •

POSITION OPEN: An old and solid New England Print Works needs the services of an additional Colorist. He must be experienced and thoroughly capable of close color matching, and keeping the Print Machines running. He must be familiar with the use of Vats, Pigments, Fiber Reactives, Rapidogens, etc., and application to all cotton fabrics (no mixtures). This position is an addition to our staff and not a replacement. Our own people know about this ad. Please send full particulars of your qualifications in first letter. Salary commensurate with the responsibility. All applications will be held in strict confidence. Write Box No. 190

WANTED: YOUNG TEXTILE CHEMIST for dyeing and finishing plant. Excellent opportunity with growing National concern, Southeastern laboratory. Must have degree in Textile Chemistry with 2 to 3 years of mill experience in synthetics. Send resume. Write Box No. 184

WANTED: DYER—Pigment Pad experience on synthetics and some knowledge of finishing required. New England Plant. Advise age, experience and salary desired. All replies held in strict confidence. Write Box No. 188

• OPPORTUNITIES AVAILABLE •

CHEMIST WANTED:—With good technical training and 2-4 years product development experience formulating emulsions in the cosmetic or allied fields. Position has good potential for advancement. All inquiries treated as strictly confidential. Write—Dr. Jack J. Goodman, THE TONI CO., Merchandise Mart, Chicago 54, Illinois.

CONNECTION WANTED: — WITH COMMISSION DYER AND FINISHER FOR NOVELTY TRICOT FABRIC. ALL YEAR WORK. Write Box No. 189

WANTED: CHEMIST DYER—Graduate Textile Chemist or Chemical Engineer. Up to 5 years actual textile production background with supervisory experience. Assistant to dyeing supervisor, New Jersey location. Reply in confidence and with salary requirements to Box No. 187

WANTED: Technical Sales and Trouble Shooting Specialty house servicing textile and paper trades requires technically trained man. Prefer chemistry graduate with experience in textile or paper industries. Heavy travel from N. Y. metropolitan area. Salary open. Submit complete resume and salary requirements with first letter. Write Box No. 191

WANTED: TEXTILE DEVELOPMENT CHEMIST—College graduate—chemistry and practical warp sizing experience, to carry out lab and field development. Work on new warp sizing products. Candidate must be aggressive, imaginative and capable of taking charge of a project with a minimum of direction. This position offers a challenge and opportunity for the right man. Location: Charlotte, N. C. Salary open and liberal benefits. Send complete resume, Personnel Director, STEIN HALL & CO., INC., 285 Madison Ave., New York 17, N. Y.

• PERSONNEL AVAILABLE •

POSITION WANTED: B. S. TEXTILE CHEMISTRY, age 29, 5 years experience in dyeing laboratory of leading piece goods dyehouse. Desires opportunity to re-enter some phase of textiles, preferably dyeing. After being out of industry 3½ years. New York, New Jersey area. Write Box No. 185

POSITION WANTED: SUPERVISOR—Experienced in resin processing and finishing of tubular knit fabrics now available. 20 years experience in the Knit Goods Trade including bleaching and dyeing. Excellent references. Write Box No. 186

POSITION WANTED: TEXTILE CHEMIST — B.S. degree, over 20 years experience. Manufacturing auxiliaries, resins, surface active agents, sulfonated oils, application research, production control, technical sales service.. Presently employed. Desire opportunity as supervisor here or abroad. Write Box No. 192

POSITION WANTED: DYER OR SALES DEMONSTRATOR—B.S. degree Textile Chemistry. 9 years experience as dyer of all synthetic and natural tubular knit goods on Beck and Paddle machines. Efficient on production techniques, excellent color matcher. Salary and location open. Write Box No. 193

AMERICAN DYESTUFF REPORTER

BINDER

—to hold all 26 issues of the Dyestuff Reporter as they come out in 1961. Get one for 1960 copies as well.

—Sturdy, hard-cover, locking metal blades. Keeps copies safe, clean, neat and handy. Name is gold-stamped on front and spine.

ONLY *$4.50* EACH

Send check with order to:

AMERICAN DYESTUFF REPORTER

44 East 23rd Street

New York 10, NY

REPRINTS

from AMERICAN DYESTUFF REPORTER

The following technical articles—reprinted from recent issues of American Dyestuff Reporter—are available in limited quantity, at prices shown. Send check, money order, or stamps to address below:

Title	*Price*
A COMPARISON OF FABRIC TEAR TESTS	15¢
A STUDY OF THE AATCC ACCELEROTOR WHILE OPERATING AT CONSTANT POWER	15¢
ACRYLICS IN TEXTILE BINDING APPLICATIONS	25¢
CONTINUOUS DEVELOPMENT OF DIRECT, DEVELOPED DYEINGS	15¢
DETECTION AND GEOGRAPHICAL ORIGIN OF IRON-SPOTTED RAW COTTON	20¢
IDENTIFICATION OF UNKNOWN SYNTHETIC FIBERS—PART I	25¢
LAUNDERING ON WOVEN WOOL FABRICS IN A MODERN HOME WASHING MACHINE	20¢
MECHANISMS INFLUENCING THE WASH AND WEAR CHARACTERISTICS OF CELLULOSIC FABRICS	25¢
METHODS TO IMPROVE RESILIENCE OF COTTON PILE YARNS IN SOFT FLOOR COVERINGS	25¢
NONIONIC DETERGENTS IN RAW WOOL SCOURING INCLUDING STUDIES OF WASTE CLARIFICATION	25¢
PILE FABRICS	25¢
PINONIC ACID AS A MERCERIZING PENETRANT	15¢
REDUCING THE FELTING SHRINKAGE OF WOOL	35¢
RESEARCH ON DYEING CYANOETHYLATED FIBERS	15¢
ROVANA—VERSATILE NEW YARN	25¢
SEMIMICROQUANTITATIVE ANALYSIS OF COPPER 8-QUINOLINOLATE A Demonstration of Uneven Deposition of Fungicide on Cellulosic Materials as a Major Variable in Deterioration Evaluation	25¢
SOME FACTORS INVOLVED IN "WASH-AND-WEAR" WOOL	25¢
TEXTILE CHEMICALS—MARKETS & TECHNOLOGY	25¢
THE ARRHENIUS EQUATION IN ACCELERATED AGING STUDIES	15¢
THE DETERMINATION OF THE SOLUBILITY OF DYES	15¢

Write: REPRINTS, American Dyestuff Reporter
44 East 23rd Street, New York 10, N Y

POLYLUBE FFN SPECIAL

...Laurel's versatile finishing agent

Now is the time to join the industry swing to POLYLUBE FFN . . . Laurel's new, *improved*, non-ionically dispersed polyethylene emulsion. These advantages tell why it is best for use in your plant:

. . . POLYLUBE FFN's superior lubricating properties at high temperatures make it an ideal high-speed sewing thread lubricant.

. . . POLYLUBE FFN imparts a soft springy hand to piece goods—improves the drape as well as sewing and cutting properties.

. . . POLYLUBE FFN, applied to resin-treated goods materially increases both tear strength and crease resistance.

. . . POLYLUBE FFN is stable to acids, alkalies, and salts even in very high concentrations for extended periods of time.

Like to know more about this versatile Laurel finishing agent? Write for complete details and a generous sample. No obligation, of course.

Laurel

SOAP MANUFACTURING CO., INC.

TIOGA, THOMPSON & ALMOND STS. • PHILA. 34, PA.

Warehouses: Paterson, N.J. Chattanooga, Tenn. Charlotte, N.C. Greenville, S.C.

ADR ADVERTISING INDEX

Allied Chemical Corp.
National Aniline Division 20
Nitrogen Division
Solvay Process Division
Althouse Chemical Company
American Cyanamid Co.
American Dyestuff Reporter 67, 69
American Dyewood Co., Inc.
Ansbacher-Siegle Corporation
Antara Chemicals Div., General Aniline & Film Corp.
Apex Chemical Co., Inc.
Archer-Daniels-Midland Company
Arkansas Company, Inc. 61
Arnold, Hoffman & Co., Inc. 15
Atlantic Refining Co., The
Atlas Electric Devices Co.

Baker Chemical Co., J. T.
Becco Chemical Division
FMC Corporation 33, 34
Berkshire Color and Chemical Co. 10
Birch Brothers, Inc.
Burkart-Schier Chemical Co. 66
Butterworth & Sons Co., H. W.

Calgon Company
Campbell & Company, Inc., John
Carbic-Hoechst Corp.
Chemical Products Corp. 55
Chlor-Alkali Division
FMC Corporation 5
Ciba Company, Inc.
Columbia Southern Chemicals (Pittsburgh Plate Glass Co., Chemical Div.) 12
Crescent Chemical Company, Inc.

De Paul Chemical Co.
Dexter Chemical Corp. Third Cover
Dow Corning Corp. 70
Du Pont de Nemours & Co., Inc., E. I.
Dyes and Chemicals Division
Electrochemicals Department,
Peroxygen Products Division

Eastern Color & Chemical Co.
Eastman Chemical Products, Inc. 6
Emery Industries, Inc.
Emkay Chemical Co.

Fablok Mills, Inc.
Fancourt Co., W. F.
Farbwerke Hoechst, A. G.
Feeley Co., E. J. 63
FMC Corporation
Becco Chemical Division 33, 34
Chlor-Alkali Division 5
Foxboro Co., The

Gaston County Dyeing Machine Co.
Geigy Dyestuffs
Division of Geigy Chemical Corporation
General Aniline & Film Corp. 17
General Dyestuff Company 17
Goodyear Chemical Division 11
Goodrich Chemical Company, B. F. 4
Gross & Company, A.

Hagan Chemicals & Controls, Inc.
Hampshire Chemical Corporation
Harchem Division, Wallace & Tiernan, Inc.
Harshaw Chemical Co., The
Hart Products Corporation, The
Hercules Powder Company
Heyden Newport Chemical Corporation
Hilton-Davis Chemical Co., Division 13
Hoechst Chemical Corp.
Howes Publishing Company, Inc. 67, 69

NATIONAL CONVENTION

BUFFALO, N.Y. • SEPT. 27-30, '61.

This annual AATCC CONVENTION is the first to be held in this area.

Because of the nearness to Canada, both the AATCC and the CATCC are planning many features which will contribute to a very interesting and instructive convention.

American Dyestuff Reporter—official publication of the Proceedings of the AATCC—will be publishing the official issue for this important Convention, on September 18, 1961 to give Association members plenty of time to study complete program details and make their Convention Plans.

American Dyestuff Reporter's AATCC Convention Issue will contain details on all the many Convention events and technical sessions, plus special stories on awards and contests, and interesting background and historical data, and complete Convention program.

This is the big event of the year. Therefore, this issue must have a place on any proper advertising schedule directed to textile wet-processing plants.

ADVERTISING FORMS WILL CLOSE AUGUST 28th, 1961.

Dow Corning
SILICONE DEFOAMERS

CHOP OPERATION COSTS

Most effective. Dow Corning silicone defoamers are best for banishing space-filling, time-eating foam in the processing of any foamer . . . from asphalt to beans to peas to zeins. Dow Corning Silicones start quicker, last longer. Eliminate messy and unsanitary foam-overs. Turn maintenance into production time.

Most efficient. Even the most violent foamers are tranquilized with a tiny amount of a Dow Corning silicone defoamer — often one part silicone solids per 10 million parts foamer is effective. For true economy, change to a Dow Corning antifoamer or defoamer. There's one just right for your product and system — oil, aqueous or food.

FREE SAMPLE

Send today for a generous trial sample and full data. Please specify type of system. Address Dow Corning Corporation, Midland, Michigan, Dept. 0919.

first in silicones **Dow Corning**

ADR ADVERTISING INDEX

Interchemical Corp., Color & Chemicals Division
International Salt Co.

Klauder Weldon Giles Machine Co.
Kolker Chemical Corp.
Koppers Company, Inc. 3

Laurel Soap Manufacturing Co., Inc. 68
Leatex Chemical Company
Lestoil Products, Inc.

Manufacturers Chemical Company, Inc.
Marbon Chemicals Div. of Borg-Warner Corp. 8
McCarty Aniline & Extract Co.
Metalsmiths Div., Orange Roller Bearing Co., Inc.
Moretex Chemical Products Inc.
Morningstar-Paisley, Inc.
Morton Salt Co. 19

National Aniline Division
Allied Chemical Corp. 20
National Starch and Chemical Corporation
Nitrogen Division, Allied Chemical Corp.
Nopco Chemical Company
Nyanza Color and Chemical Co.

Olin Mathieson 14
Onyx Chemical Company
OPW-Jordan
Organic Chemical Corporation

Philadelphia Quartz Co.
Photovolt Corp.
Pittsburgh Plate Glass Co., Chemical Div.
Procter & Gamble
Putnam Chemical Corp.

Reading Scientific Company
Refined Products Company
Rohm & Haas Co. 56
Rona Pearl Corporation
Royce Chemical Company Fourth Cover
Rudnick Representatives, Edward S.
Rumford Chemical Works

Sandoz, Inc.
Scholler Bros., Inc.
Seydel-Woolley & Co.
Shell Chemical Company
Solvay Process Division, Allied Chemical Corp.
Sou-Tex Chemical Company, Inc.
Standard Chemical Products, Inc.
Sun Chemical Company

Tanatex Chemical Corp. Second Cover
Taylor Instrument Companies 16
Tennessee Corporation
Tex-Chem Co.
Texize Chemicals, Inc.
Toshin Kogyo Co., Ltd.
Turbo Machine Company

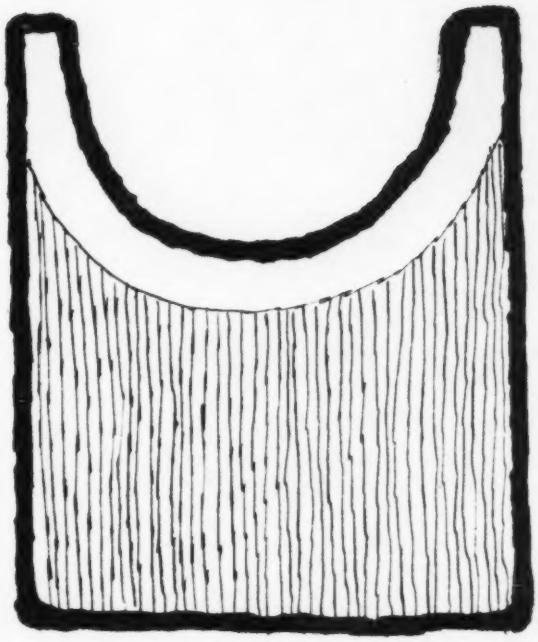
Union Carbide Corp. 53

Verona Dyestuffs
Virginia Chemicals & Smelting Company

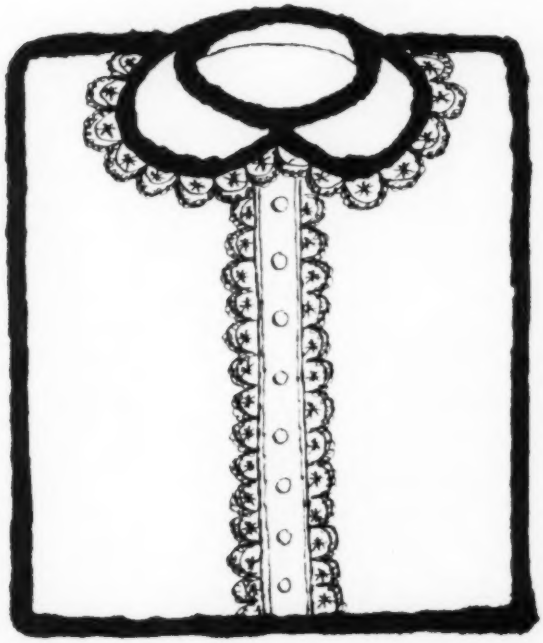
Wallace & Tiernan, Inc., Harchem Division
Wallerstein Company 18
Watkins Salt Co.
West Indies Chemical Works, Ltd., The
Wica Chemicals, Inc. Front Cover
Wolf & Co., Jacques

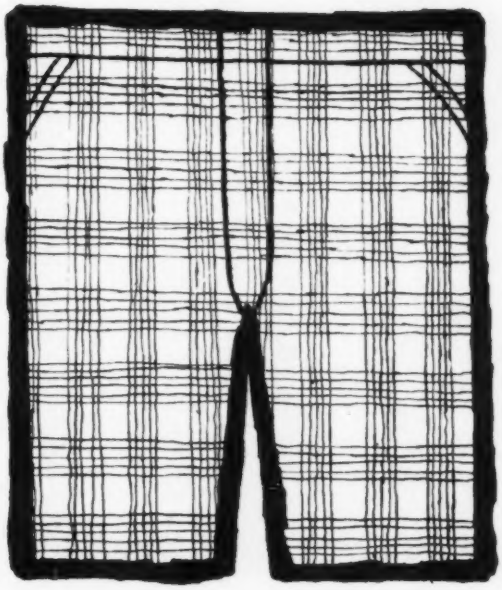
Young Aniline Works, Inc. 65

Zinsser Division
Harshaw Chemical Co.



For all Textile Applications **dextraset® resins**





You can keep the promises you make for every yard of fabric finished with Dextraset thermosetting resins. These resins are produced under strict quality control with the latest techniques and equipment. May we show you how a Dextraset resin can help you in your resin finishing applications?

D-24

dexter chemical corporation ■ textile chemical division, new york 59 ■ boston ■ charlotte ■ atlanta ■ greensboro ■ buenos aires

PAROLITE!

MORE *ACTION*, POUND FOR POUND!

THE REAL COST OF STRIPPING AGENTS CAN ONLY BE CALCULATED BY COMPARING THE AMOUNT OF WORK THEY DO PER DOLLAR OF COST, AND ON THIS BASIS PAROLITE* PRESENTS ONE OF THE BEST BUYS IN THE TEXTILE BUSINESS!

*Normal Zinc-Sulphoxylate Formaldehyde

VERSATILE...PAROLITE will accomplish virtually all of your stripping of wool and synthetics.

EFFICIENT...PAROLITE dissolves quickly leaving no trace of Zinc in the stripped goods which are left soft and in excellent condition for further processing.

STABLE...PAROLITE CAN BE KEPT INDEFINITELY in a minimum of storage space.

SAFE...PAROLITE is easy on personnel—does not irritate skin.

SEND TODAY... for detailed information.

DISCOLITE*
(Sister product to PAROLITE) is unexcelled for discharge and vat printing—keeps its reducing power even when dried into the cloth.
*Sodium Sulphoxylate Formaldehyde

Royce

ROYCE CHEMICAL CO.

CHEMICAL COMPANY
CARLTON HILL, NEW JERSEY